Board of Education

5 Minortown Road ~ Woodbury, CT 06798
www.ctreg14.org

Mission: The mission of Connecticut Region 14 Schools is to educate all students to their highest level of academic potential and to teach them the skills and knowledge to become capable, creative, collaborative lifelong learners and responsible members of the world community.

Board of Education Goals:
Academic Performance - The district will strive to improve academic performance for all students on multiple assessment indicators and the staff will be committed to continuous improvement.
Communication - Region 14 will develop partnerships with all stakeholders in the school community to highlight the exemplary programs the district offers
Safety - Region 14 will provide safe and secure facilities equipped with technology, enabling a 21st century learning environment that supports the values of the district
Budget - Region 14 will prepare a budget that meets the needs of every student and communicates the needs and priorities of Region 14 in a clear and concise manner.

A G E N D A

Regular Meeting of the Region 14 Board of Education
Monday, February 2, 2026; 6:00 p.m.
Mitchell Elementary School/Flanders Room

I. Call to Order.....Chris Matta

II. Pledge of Allegiance.....Chris Matta

III. Introductions.....Chris Matta

IV. Approval of Minutes (Action Anticipated) .....Chris Matta
- A. Special Meeting, Wednesday, January 7, 2026
- B. Regular Meeting, Monday, January 12, 2026

V. Superintendent's Report
- A. Student Representative Report
- B. Bethlehem Elementary School Development Plan/"The Bulldog Beat" – A Bethlehem Elementary School Publication
- C. Mitchell Elementary School Development Plan
- D. Nonnewaug High School Football Co-op Update

VI. Committee Reports

A. Athletic Committee Update

B. Finance Committee Update

C. Policy Committee

On a recommendation by the Policy Committee to accept/approve the following policies: (First Read, No Action Anticipated)

A. Policy 1312.3/6161.12 Library Materials Review and Reconsideration
B. Policy 4212.42 Drug and Alcohol Testing for School Bus Drivers

D. Curriculum Committee

On a recommendation by the Curriculum Committee to accept/approve the following curricula and courses (Action Anticipated)

I. Curriculum Documents for Approval
   A. 8th Grade Math
   B. Digital Music
   C. Accounting I
   D. Accounting II
   E. Marketing II
   F. Algebra 2 with Financial Concepts
   G. Geometry
   H. AP Psychology

II. New Courses for Approval
   A. Computer Aided Drafting 1/CTState 1330
   B. Computer Aided Drafting 2/CTState 2200
   C. An American History of Rock and Soul

VII. Board Chair's Comments

VIII. Privilege of the floor

The Board of Education will recognize citizens of Bethlehem and Woodbury, any parent/guardian of a child enrolled in the Region 14 School District, or any current employee of the Region 14 School District who are asked to state their name and town of residence and to please limit comments to three (3) minutes. Up to 21 minutes of statements per topic are allowed. All comments should be addressed to the Board of Education Chair. Decorum will be enforced.

IX. Old Business

X. New Business

XI. Other Business

XII. Adjournment

M I N U T E S
Board of Education
Special District Meeting
Wednesday, January 7, 2026; 6:00 p.m.
Auditorium
Nonnewaug High School

Present:
Chris Matta, Chair
Alice Jones
Jim Crocker
Carol Ann Brown
Tikva Rose
Michael Carbonneau
Caren Lipinski

Also Present:
Brian Murphy, Superintendent of Schools
Tina Tanguay, Director of Finance and Operations

I. CALL TO ORDER and PLEDGE OF ALLEGIANCE
Chairman Matta called the meeting to order at 6:00 p.m.
The Pledge of Allegiance was formally recited

II. APPOINTMENT OF MODERATOR
Chairman Matta appointed Mr. Jamie McLaughlin as Moderator of the Meeting

III. APPOINTMENT OF MEETING CLERK BY MODERATOR
Mr. McLaughlin appointed Patricia Paige as Clerk of the Meeting

IV. CALL OF MEETING
Mr. McLaughlin read the Call of the Meeting and established procedural guidelines

WARNING/LEGAL NOTICE OF SPECIAL DISTRICT MEETING

All electors who are registered to vote in the Towns of Bethlehem and Woodbury, Connecticut, are hereby notified and warned that a Special Meeting of Regional School District #14 will be held in the auditorium of Nonnewaug High School, 5 Minortown Road, Woodbury, Connecticut on Wednesday, January 7, 2026 at 6:00 p.m.

DRAFT

The Regional School District 14 Board of Education does not discriminate on the basis of race, color, religion, marital status, national/ethnic origin, age, sex, gender identity or expression, sexual orientation, or disability in its programs, activities, and employment practices as set forth in compliance with the Office of Civil Rights, Title VI, Title IX, and Section 504. Any person having inquiries concerning Regional School District 14 Public Schools' compliance with Section 504, Title VI or Title IX should contact: Dina Ericson, Director of Student Services, Regional School District 14, 5 Minortown Road, PO Box 469, Woodbury, CT 06798 (203) 263-6356

Purpose:

(1) To **nominate** at least two (2) candidates who reside in Bethlehem to fill a vacancy on the Regional School District 14 Board of Education for the remainder of the unexpired term (through June 30, 2028); and

(2) To **elect** one (1) such person from said Bethlehem candidates to fill the vacancy and serve on the Board for said term.

Attendance and nominations shall be made **in person** only. Following nominations, all votes will then be cast **in person** only.

V. Nominations

Mr. McLaughlin called for nominations

Motion:
George Rehkamp
94 Woodcreek Lane
Bethlehem, CT

Nominated:
Mark Crane
51 Bethlehem Lane
Bethlehem, CT

Second:
Katie Mayer
29 Main Street South
Bethlehem, CT

Motion:
Mary Peterson
161 Hard Hill Road North
Bethlehem, CT

Nominated:
Brian Peterson
161 Hard Hill Road North
Bethlehem, CT

Second:
Alyssa Goggin
446 Main Street South
Bethlehem, CT

Motion:
Tara Lanese
35 Long Horizon Road
Bethlehem, CT

Nominated:
Bridget Calabrese
24 Long Horizon Road
Bethlehem, CT

Second:
Ryan Calabrese
24 Long Horizon Road
Bethlehem, CT

Prior to the election, nominees were invited to say a few words in support of their candidacy.

VI. Election
Hearing no further nominations, Mr. McLauglin called for the election process to begin

Election Results:

Bridget Calabrese	205
Mark Crane	71
Brian Peterson	5

VII. Adjourn
Mr. McLaughlin adjourned the meeting at 7:53 p.m.

Respectfully submitted,



Patricia Paige
Board Clerk

Recorded and filed subject to Board of Education approval by: Patricia Paige, Board Clerk

Minutes
Regular Meeting of the Region 14 Board of Education
Monday, January 12; 6:00 p.m.
Flanders Room
Mitchell Elementary School

Present:
Chris Matta, Chair
Alice Jones
Jim Crocker
Caren Lipinski
Michael Carbonneau
Bridget Calabrese
Carol Ann Brown

Absent:
Tikva Rose

Also Present:

I. Call to Order
Chairman Matta called the meeting to order at 6:00 p.m.

II. Pledge of Allegiance and Introductions
The Pledge of Allegiance was recited and acquaintances were made

II. Approval of Minutes
A. **Special Meeting, Monday, December 8, 2025**
A motion was made by Chris Matta and seconded by Alice Jones to accept/approve the minutes as presented, all in favor, none opposed, motion carried unanimously.

III. Superintendent's Report
A. Student Representative Report
Student Representative Maia Colavito provided reports for both Nonnewaug High School and Woodbury Middle School.
Nonnewaug High School
- Orange Out, color of leukemia awareness, to honor John Cheung
- Winter concert
- FFA Cookie Decorating Social
- Shepaug Rivalry Games with both the boys' and girls' teams winning
- SAT Study Groups
- Semester wrapping up soon/mid-year exams
- Chiefs with Character Breakfast

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Woodbury Middle School

- Parent/Teacher Conferences
- WMS Winter Concert
- Christmas Tree of Gratitude
- NWEA Testing

B. Leaves of Absence

Superintendent Murphy made two recommendations for teachers requesting extended maternity leaves of absence.

1. **Jennifer Jedd until January 5, 2027**
   A motion was made by Chris Matta and seconded by Carol Ann Brown to accept/ approve the extended leave of absence as presented, all in favor, none opposed, motion carried unanimously.

2. **Heather Casey/January 4, 2027**
   A motion was made by Chris Matta and seconded by Caren Lipinski to accept/approve the extended leave of absence as presented, all in favor, none opposed, motion carried unanimously.

C. Woodbury Middle School Development Plan/Nonnewaug High School

Principals Bill Nemec and Myke Kuslis, along with their assistant principals Suzi Greene and Declan Curtin respectively, presented their School Development Plans to the board. Reports centered on goals, supported by strategic approaches for achievement, comparison data, and progress.

IV. Committee Reports

A. Finance Committee

- Revenue collected as of December 31st is $22,025,293 or 51.49% of budget
- Expenditures as of December 31st total $19,985,859 or 46.73% of anticipated budget
- District tuition will be billed in January once new semester begins
- Budget position on track at mid-year point
- Mike Molson completed required HVAC systems review and submitted updated forms to state
- HVAC compliance documentation posted on district website under facilities section titled "HVAC Systems Update Notification 2025"

B. Policy Committee

On a recommendation by the Policy Committee to accept/approve the following policies (Second read, action anticipated)

1. Policy 1312.4/6161.13 Library Collection Development and Maintenance

DRAFT

A motion was made by Chris Matta and seconded by Caren Lipinski to accept/approve the policy as presented, 6 were in favor, none opposed, Bridget Calabrese abstained, motion carried.

2. Policy 9230 New Board Member Orientation
   A motion was made by Chris Matta and seconded by Jim Crocker to accept/approve the policy as presented, 6 were in favor, none opposed, Bridget Calabrese abstained, motion carried.

V. Board Chair Comments

Chairman Matta thanked the candidates who recently ran for the vacant Board of Education seat, the meeting moderator, Jamie McLaughlin, and the voters. He also welcomed Bridget Calabrese as the Board's newest member.

VI. Privilege of the Floor

There were no participants for Privilege of the Floor

VII. Old Business

There was no Old Business brought before the board

VIII. New Business

A. 2026/2027 Region 14 School District Calendar
   A motion was made by Chris Matta and seconded by Alice Jones to accept/approve the 2026/2027 Region 14 School District Calendar as presented, all in favor, none opposed, motion carried unanimously.

B. Field Trip, April 13, 2026 to April 17, 2026, Music Department to Disney World, Orlando, Florida
   - Music teacher Nick Ciasullo provided a brief overview of the proposed trip to Walt Disney World in Orlando
   - Trip dates: April 13-17, 2026, during spring break
   - Itinerary includes recording workshops, theme park time, visit to United Kingdom pavilion to see peer musicians perform
   - Expected attendance: 20 to 40 students

   A motion was made by Chris Matta and seconded by Jim Crocker to accept/approve the field trip as presented, all in favor, none opposed, motion carried unanimously.

IX. Other Business

A. Superintendent's Mid-Year Evaluation (Executive Session Anticipated)
   <u>Executive Session</u>
   A motion was made by Chris Matta and seconded by Jim Crocker to enter into Executive Session for the purpose of the Superintendent's Mid-Year Evaluation. The Board invited Superintendent Brian Murphy into executive

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session; all in favor, none opposed; motion carried unanimously. The board and invited parties entered executive session at 7:38 p.m.

Public Session
The Board returned to public session at 8:25 p.m.

Motion
There was no motion

X. Adjournment

A motion was made by Chris Matta and seconded by Jim Crocker to adjourn the meeting at 8:26 p.m., all in favor, none opposed, motion carried unanimously.

Respectfully Submitted,



Patricia Paige
Board Clerk
Recorded and filed subject to Board of Education approval by: Patricia Paige, Board Clerk
Minutes created with assistance of Circleback AI"

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Community Relations/Instruction

Library Material Review and Reconsideration Policy

Statement of Policy:

The Region 14 Board of Education understands that, on occasion, a member of the public will wish to lodge a complaint against instructional material used in the classroom or available in the school library/media center. Consideration of requests to reconsider and remove material, displays, or student programs is limited to individuals with a vested interest. An individual with vested interest may challenge any library and other educational materials, display or student program by initiating a review of such material via the submission of a request for reconsideration form.

It shall be the policy of the Region 14 Board of Education that the removal, exclusion or censoring of any book shall not occur on the sole basis that a person with a vested interest finds such book offensive. No library and other educational material, display, or program shall be removed from library media centers, or programs be canceled, because of the origin, background, or viewpoints expressed in such material, display, or program, or because of the origin, background, or viewpoints of the creator of such material, display, or program. Library and other educational materials, displays, and student programs shall only be excluded for legitimate pedagogical purposes or for professionally accepted standards of collection maintenance practices as adopted in the collection development and maintenance policy or the display and program policy.

Until a final decision is made by the review committee, any library and other educational material being challenged shall remain available in the school library media center according to such material's catalog record and be available for a student to reserve, check out, or access.

A school district may consolidate any requests for review and reconsideration of the same challenged library and other educational material. Once a decision has been made by **the review committee** on any library and other educational material, such material cannot be subject to a new request for review and reconsideration for a period of three years.

The Region 14 Board of Education will review and update this policy as necessary every five years.

Definitions

"Library and other educational material" means any material belonging to, on loan to or otherwise in the custody of a school library media center, including, but not limited to, nonfiction and fiction books, magazines, reference books, supplementary titles, multimedia and digital material, software and other material not required as part of classroom instruction.

Community Relations/Instruction

Library Material Review and Reconsideration Policy

Definitions (continued)

"School library staff member" means a school library media specialist, school librarian, any certified or non-certificated staff member whose assignment is in the school library or any individual carrying out or assisting with the functions of a school library media specialist or school librarian.

"Individual with a vested interest" means any school staff member employed by a local or regional board of education, parent or guardian of a student currently enrolled in a school at the time a reconsideration form is filed, or any student currently enrolled in a school at the time a reconsideration form is filed.

"Remove" means deliberately taking library material out of a library's collection. **"Remove"** does not include the process of clearing such collection of any materials that are no longer useful.

Material Review and Reconsideration Procedure

The Board of Education has established the following procedure for addressing complaints regarding the utilization of library and other educational materials:

1. Individuals with a vested interest may initiate the review or reconsideration of any library and other educational materials, display, or student program by submitting a request for recommendation form to the principal of the school in which the library and other education materials are being challenged.
2. The Principal, or the Principal's designee, shall promptly forward the request for reconsideration to the Superintendent of Schools for the school district.
3. The Superintendent, or the Superintendent's designee, shall appoint a review committee consisting of:
    a. The Superintendent, or the Superintendent's designee;
    b. the Principal of the school in which the library and other educational material is being challenged, or the Principal's designee;
    c. the Director of curriculum, or a person in an equivalent position;
    d. a representative from the local or regional board of education;
    e. at least one grade-level-appropriate teacher familiar with the library material provided, the teacher selected is not the individual who submitted the form;
    f. a parent or guardian of a student *age thirteen years or younger* enrolled in the school district, provided the parent or guardian selected is not the individual who submitted the form;
    g. a parent or guardian of a student *aged fourteen years or older* enrolled in the school district, provided the parent or guardian selected is not the individual who submitted the form;
    h. a certified school librarian employed by such board or employed by another board of education in the state.

Community Relations/Instruction

Library Material Review and Reconsideration Policy

Material Review and Reconsideration Procedure (continued)

In cases where such form is submitted by a student enrolled in *grades nine to twelve*, inclusive, and when appropriate and at the discretion of the superintendent, a student enrolled in grades nine to twelve, inclusive, may serve on the review committee if such student did not submit the reconsideration form, provided the superintendent consults with the principal of the school involved in such reconsideration request prior to making this determination whether to include such student on the review committee.

4. The **review committee** shall evaluate the request for reconsideration form by reading the challenged material in its entirety and evaluating the challenged material against the school district's *Collection Development and Maintenance Policy*.

5. The **review committee** shall make a *written decision* on whether to remove the challenged material *within sixty school days* from the date of receiving such request and provide a copy of the committee's decision and report to *the individual with a vested interest who submitted the form and to the principal of the school*.

6. The individual with a vested interest who submitted the *request for reconsideration form* may appeal to the *review committee's decision* to the local or regional board of education for the school district. The Board shall determine whether the reconsideration process was followed and publish the decision on the school district's website.

General Provisions

Any school library media specialist or school library staff member who, in good faith, implements the policies described in this section shall be immune from any liability, civil or criminal, that might otherwise be incurred or imposed and shall have the same immunity with respect to any judicial proceeding that results from such implementation.

Policy adopted:

1312.3
6161.12
Form 1

Region 14 Public Schools

Request for Reconsideration of Library Books/Materials

Title _____

Author _____ Publisher _____

This request was initiated by

☐ Parent/Guardian

☐ Student

☐ Other (please specify) _____

The material is best described as a:

☐ Book

☐ Video or Online Content

☐ Periodical/Magazine

☐ Other Media. Please specify _____

Please answer the following questions:

1. Did you read, view, or listen to the entire work? If not, what parts did you examine?

_____
_____
_____

2. In what specific ways do you think this work is inappropriate for students?

_____
_____
_____

3. What have you been told about the educational purpose of this material?

_____
_____
_____

4. What do you believe is the theme or purpose of this material?

5. For what age group would you recommend this material?

6. Are you aware of the judgment of this work by literary critics and/or professional educators/organizations?

7. What are the valuable aspects of this material?

8. What do you feel may be the results of students reading, listening to, or viewing this material?

9. What work/material of equal or superior value would you recommend replacing the one in question?

10. Please explain your reasons for your objection:

Signature of Complainant

Date

1312.3
6161.12
Form 2

REGION 14 PUBLIC SCHOOLS
WOODBURY, CONNECTICUT

Request for Appeal of Reconsideration of Library and Other Educational Materials Decision

Full Legal Name: _____ Title of Material:_____

Address: _____ Telephone Number: _____

Author:_____ Publisher: _____

Date the Reconsideration Decision was communicated to you: _____

Please explain why you are appealing against this decision:

_____
_____
_____
_____
_____
_____
_____
_____
_____

How do you believe the review committee failed to follow the reconsideration process?

_____
_____
_____
_____
_____
_____

Are you submitting any documentation with this appeal? If so, please list/describe supporting documents:

_____
_____
_____
_____
_____
_____

1312.3
6161.12
Complainant
Letter

REGION 14 PUBLIC SCHOOLS
WOODBURY, CONNECTICUT

Sample Letter to Complainant

Date: _____

Complainant Name
Address Line 1
Address Line 2

Dear [Complainant's Name],

Thank you for bringing your concerns regarding one of our school's library materials to our attention. In accordance with Connecticut state law, our school has a procedure in place to adjudicate concerns and reconsideration requests.

To facilitate this review, we kindly request that you submit a *Request for Reconsideration* of *Library Books and Materials* form to clearly identify the specific content you find objectionable and describe the nature of your concerns. Once your submission is received, it will be forwarded to the District Library Review Committee for formal consideration. The Committee's review process includes thoroughly reviewing the material, assessing its educational value, and addressing all concerns raised.

If you have any questions or require assistance with this process, please do not hesitate to contact me at [phone number or email address].

Thank you for engaging with us to support a thoughtful and responsible approach to creating libraries that meet the needs of all students.

Sincerely,

[Your Name]
[Your "Vested Interest" Identity]

Personnel -- Non-Certified

Drug and Alcohol Testing for School Bus Drivers

Contracts for transportation approved by this District shall contain assurance that the contractor will establish a drug and alcohol testing program that meets the requirements of federal regulations.

In addition, the Board of Education expects its school transportation contractor to train all school bus drivers, with instruction pertaining to the identification, the signs and symptoms of anaphylaxis, and in the administration of epinephrine by a cartridge injector ("EpiPen"), the notification of emergency personnel, and the reporting of an incident involving a student's life-threatening allergic reaction. Such training shall occur following the issuance or renewal of an endorsement to operate a school bus for carrier employees, and upon the hiring of a school bus driver, except a driver who received the training after the most recent issuance or renewal of his or her endorsement is not required to repeat it.

Prior to employment of bus drivers, the Board of Education expects its school transportation carrier to conduct a full query of the Federal Motor Carrier Safety Administration's Drug and Alcohol Clearinghouse (Clearinghouse) to obtain information about the driver's eligibility under federal rules to perform a safety-sensitive function. The District/school transportation carrier will also contact prior employers where the applicant was a CDL driver for information to determine the driver's eligibility to perform safety-sensitive functions. (Prior employers' inquiries will continue until January 2023.)

The school transportation carrier will also utilize the Clearinghouse for current CDL drivers who are employees on at least an annual basis. Required personal information that is collected and maintained in connection with the testing program shall also be reported, as required, to the Clearinghouse.

Legal Reference: United States Code, Title 49

2717 Alcohol and controlled substances testing (Omnibus Transportation Employee Testing Act of 1991)

Code of Federal Regulations, Title 49

40 Procedures for Transportation Workplace Drug and Alcohol Testing Programs

382 Controlled Substance and Alcohol Use and Testing (as amended)

395 Hours of Service Drivers

Holiday v. City of Modesto (1991) 229 Cal. App. 3d. 528, 540.

Personnel -- Non-Certified

Drug and Alcohol Testing for School Bus Drivers

Legal Reference: Connecticut General Statutes (continued)

International Brotherhood of Teamsters v. Department of Transportation

932 F. 2d 1292 (1991)

American Trucking Association, Inc. v. Federal Highway Administration, (1995) WL 136022 (4th circuit)

10-212c Life-threatening food allergies and glycogen storage disease: Guidelines; district plans. (as amended by PA 18-185)

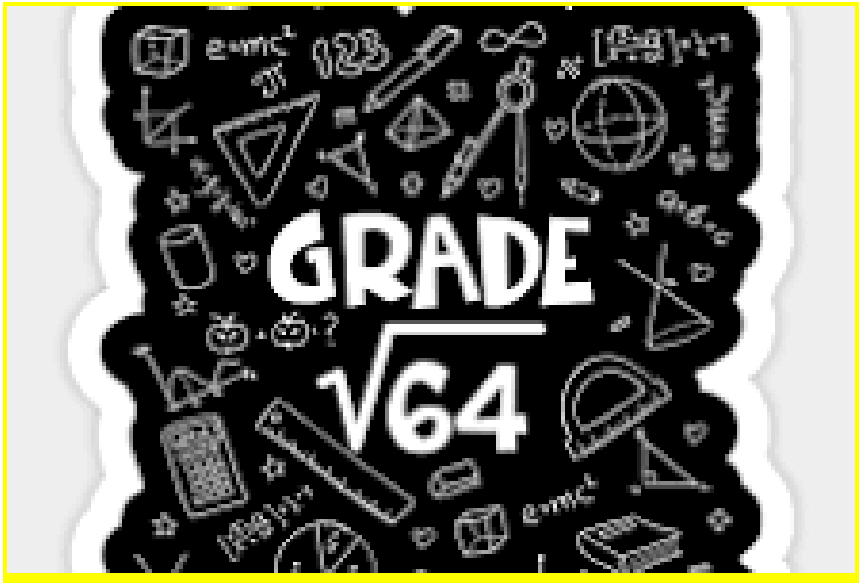
14-261b Drug and alcohol testing of drivers of certain vehicles, mechanics and forklift operators

14-276a Regulations re school bus operators and operators of student transportation vehicles; qualifications; training. Pre-employment drug test required for operators

52-557b Immunity from liability for emergency medical assistance first aid or medication by injection. School personnel not required to administer or render. (as amended by PA 18-185, An Act Concerning the Recommendations of the Task Force on Life-Threatening Food Allergies in Schools)

Policy adopted:
rev 10/18
rev 2/20
rev 1/21

Grade 8 Math CURRICULUM



Grade Level(s): 8th Grade

Curriculum Author(s): Cate Lyman, Connor Mooney

Course Description: Math 8 continues to set a strong foundation in mathematics to prepare students for success in Algebra in high school. Students begin 8th grade with the concept of congruence and transformations such as rotations and translations. Next students build upon their study of scaled copies in 7th grade to include the concept of similarity which leads to understanding the slope of a line. Students expand upon the study of rates and proportional relationships in an introduction to linear functions and an introduction to solving systems of linear equations. Students further develop the concept of a function in mathematics through analyzing tables, graphs, and equations. Students also work with bi-variate data and learn to analyze associations using scatterplots and fitted lines for numerical data and tables, and bar graphs for categorical data. In addition, students learn about the volume of cylinders, cones and spheres, rules of exponents, scientific notation and are introduced to irrational numbers with the application of the Pythagorean Theorem.

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Unit 1: Rigid Transformations and Congruence	How can we use transformations and angle relationships to understand the structure of shapes and the way lines and angles connect and interact?	Understanding geometric transformations and angle relationships helps students recognize when shapes are the same size and shape, and how lines and angles behave in predictable ways. These tools allow students to make sense of shapes, movements, and connections in geometry.	T13(6-8), **P4**(6-8), TCC2(6-8), **CCE1**(6-8), **DE4**(6-8)
Unit 2: Dilations, Similarity, and Introducing Slope	What makes two figures similar, and how can similarity help us understand relationships like slope?	Similarity, defined through dilations and rigid motions, provides a foundation for comparing figures and developing a geometric understanding of slope as a consistent rate of change.	TI3(6-8), P4(6-8), TCC2(6-8);CCE1(6-8), CCE3(6-8), DE4(6-8), **TI2**(6-8)**,** P3(6-8)
Unit 3: Linear Relationships	How do we recognize, describe, and represent relationships that change at a constant rate?	Linear relationships describe situations with a constant rate of change, and understanding slope allows us to connect equations, graphs, and real-world contexts.	CCE3(6-8), DE4(6-8), **P3**(6-8)**, P4**(6-8)**,** TI3(6-8), **TCC2(6-8)**
Unit 4: Linear Equations and Linear Systems	What do the solutions to linear equations and systems tell us about the relationships between quantities?	Linear equations and systems help us represent and solve real-world problems by showing how different quantities are connected. Solving them helps us figure out what values make sense together—and when no solution is possible.	**TCC1**(6-8), TCC4(6-8), CCE3(6-8), **CCE4**(6-8)**,** DE4(6-8), P3(6-8), AA4(6-8), TI3(6-8)

Unit 5: Functions and Volume	How can functions and volume formulas be used to describe and predict relationships between quantities?	Functions describe how one quantity changes in relation to another. Volume formulas are a type of function that show how the size of a shape relates to how much space it holds.	CCE3(6-8), DE4(6-8), P3(6-8), **AA2**(6-8)**, CCE1**(6-8)**,**
Unit 6: Associations in Data	How can we identify, represent, and interpret patterns in data to make sense of relationships?	Patterns in data can be represented and interpreted through scatter plots, trend lines, and two-way tables, allowing us to analyze and predict relationships between variables.	CCE3(6-8), **DE4**(6-8), P3(6-8), **TI3**(6-8)
Unit 7: Exponents and Scientific Notation	How do the properties of exponents and scientific notation help us represent and work with very large or very small numbers?	Exponent rules and scientific notation allow us to represent and manipulate very large or small numbers efficiently, revealing structure and patterns in the number system.	**CCE3**(6-8), DE4(6-8), **P3**(6-8)
Unit 8: Pythagorean Theorem and Irrational Numbers	How do geometric relationships and number properties help us solve problems involving distance and irrational numbers?	The Pythagorean Theorem connects geometry and algebra, and understanding irrational numbers expands our view of the number system beyond rational values.	CCE3(6-8), DE4(6-8), P3(6-8), **TCC4**(6-8)**, TCC2**(6-8)

Unit 1 - Rigid Transformations and Congruence

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- 8.G.A.1: Verify experimentally the properties of rotations, reflections, and translations.
- 8.G.A.2: Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence.
- 8.G.A.3: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- 8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC2: I can evaluate data gathered from multiple perspectives and draw conclusions.
- **CCE1**: I can contribute to discussions with my peers/teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully as I apply new knowledge to my thinking.
- **P4**: I can step outside my comfort zone because I recognize that my mistakes are not failures, but rather an opportunity to learn and grow. mistakes as opportunities to learn and grow.
- TI3: I can compose specific questions that are relevant to a task to support my learning.
- **DE4**: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.

Understandings: Students will understand that...	**Essential Questions:**
• Rigid transformations (translations, rotations, and reflections)	• How do rigid motions help us understand congruence?

preserve size and shape. • Two figures are congruent if there is a sequence of rigid motions that maps one onto the other. • Coordinates can be used to describe and perform transformations. • Angle relationships in triangles and between parallel lines and transversals follow consistent, predictable patterns. • Informal reasoning and visual models can justify geometric facts like the angle sum of a triangle or relationships formed by transversals.	• What makes two shapes congruent or not congruent? • How can we describe transformations precisely using coordinates? • What angle relationships always exist in triangles and with parallel lines?
Students will know... • Definitions and properties of rigid transformations: translation, rotation, and reflection. • The definition of congruence in terms of rigid motions. • How to identify and describe a sequence of transformations. • Properties of angle relationships: vertical, adjacent, complementary, supplementary, corresponding, alternate interior. • That the sum of the angles in a triangle is always 180°, and how to justify that informally.	**Students will be able to…** • Perform and describe transformations using mathematical vocabulary and coordinates. • Use transformations to justify whether two figures are congruent. • Construct arguments and explanations using geometric transformations. • Use informal arguments to justify angle relationships in geometric figures and with parallel lines.
Key Vocabulary: Rigid transformation, Translation, Rotation, Reflection, Congruent, Coordinates, Sequence of transformations, Image, Pre-image, Angle Sum, Transversal, Alternate Interior Angles, Corresponding Angles, Vertical Angles	
Assessment Evidence	
Performance Tasks: **P4**, **CCE1** & **DE4** End of Unit Assessment: • Finding missing angles and side lengths of congruent polygons	**Other Evidence:** 1.1-1.6 Cluster Quiz CER Responses Mid Unit Assessment Exit Tickets analyzing given transformations or describing sequences

• Finding an unknown angle formed by intersecting lines • Analyzing congruence and translation between two figures • Identifying correct statements about transformations • Describing a sequence of transformations • Explaining how two polygons are congruent using precise language • Determining whether pairs of shapes are congruent and justify answers with descriptive transformations • Working with parallel lines and triangle angle relationships • Finding unknown angle measures • Understanding 180° rotations and their effect on triangle congruence • Identifying and justifying congruent angles • Applying knowledge of angle sums in triangles and quadrilaterals	Exit Tickets with student reflections on P4 and CCE1 Various Thinking Tasks using Building Thinking Classrooms instructional strategies.

Learning Plan

Lesson Focus	**Learning Activities**	**CCSS**	**Vision of a Learner Attribute**
Intro to Rigid Transformations	Paper folding and tracing to show translations, rotations, reflections	8.G.A.1	TI3, P4, CCE1, DE4, P3
Using Transparencies & Tools	Use tracing paper to verify congruence via rigid motions	8.G.A.2	TI3, P4, CCE1, DE4, P3, TCC2
Congruence through Transformations	Collaborative problem-solving to justify congruence	8.G.A.2	TI3, P4, CCE1, DE4, P3
Describing Transformations on a Grid	Grid-based tasks describing transformations algebraically	8.G.A.3	TI3, P4, CCE1, DE4, P3
Practice with Sequences	Students create and apply sequences of transformations	8.G.A.2	TI3, P4, CCE1, DE4, P3, TCC2

Angle Relationships in Triangles	Ex;lore angle sums using triangle diagrams and folding	8.G.A.5	TI3, P4, CCE1, DE4, P3, TCC2
Angles with Parallel lines and Transversals	Use visuals and reasoning to explore angle pliers and informal proof	8.G.A.5	TI3, P4, CCE1, DE4, P3, TCC2

Teacher Resources:

- Illustrative Mathematics Teacher Guide, Unit 1: https://curriculum.illustrativemathematics.org/MS/teachers/3/unit-overview.html
- Family-facing video summaries of each block (Vimeo/YouTube)
- Desmos Geometry Tools (for digital transformations)
- Paper, tracing paper, and patty paper
- Coordinate grid handouts and rulers
- IXL
- 6–8 VoL Attribute List (for guiding student reflection and integration of soft skills)

Unit 2 - Dilations, Similarity, and Introducing Slope

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- CCSS 8.G.A.1: Understand that a dilation is defined by a center and a scale factor; analyze images of circles and lines under dilation.
- CCSS 8.G.A.2: Understand similarity by connecting dilations and rigid motions to define when figures are similar.
- CCSS 8.G.A.3 / 8.EE.B.6: Use similarity (including slope triangles) to understand that any two points on a line determine the same slope, and write equations of lines via reasoning from similar triangles
- CCSS 8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
- CCSS 8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- TCC2: I can evaluate data gathered from multiple perspectives and draw conclusions.
- CCE1:I can contribute to discussions with my peers/teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully as I apply new knowledge to my thinking.

- P4: I can step outside my comfort zone because I recognize that my mistakes are not failures, but rather an opportunity to learn and grow. mistakes as opportunities to learn and grow.
- TI3: I can compose specific questions that are relevant to a task to support my learning.
- **DE4**: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.

- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.
- **T12**: I can identify my objectives and apply the best resources to my learning.

Understandings: Students will understand that…	**Essential Questions:**
• A dilation scales distances from a center by a constant factor while preserving angle measures. • Two figures are similar if one can be obtained from the other via rigid motions and dilation. • All slope triangles on the same line are similar, yielding a consistent slope that defines the relationship between vertical and horizontal change.	• How does changing the scale of a figure affect its size and shape? • What criteria determine whether two figures are similar? • How do similar triangles help us understand slope and describe lines?
Students will know...	**Students will be able to...**
• Definitions: dilation, scale factor, center of dilation, similarity, slope, slope triangle • That dilations preserve angle size but scale length by the factor • That similarity of triangles underpins the concept of slope	• Construct dilations on and off the grid using a given center and factor • Identify when two figures are similar and justify using transformations

Key Vocabulary: Dilation, Center of dilation, Scale factor, Similar, Corresponding points, sides, angles,Slope, slope triangle, Equation of a line

Assessment Evidence

Performance Tasks: **T12** & **DE4** Summative Assessment • Understanding properties of dilations (lines, circles, angles) • Identifying which statements about dilations are true • Determining which pairs of triangles are similar based on angle information	**Other Evidence:** 2.1-2.5 Quiz 2.6-2.9 Quiz Exit Tickets analyzing student learning and reflections Check Point Assessments Various Thinking Tasks using Building Thinking Classrooms instructional strategies.

• Selecting all lines that have a given slope • Determining if a student correctly drew a similar polygon • Finding missing side lengths using similarity • Calculating the slope of a line • Determining whether a specific point lies on the line • Drawing two dilations of a polygon using given centers and scale factors • Showing and explaining why the dilated figures are similar	

Learning Plan

Lesson Focus	Activities	Standards	Vision Attributes
1- 2. Projecting & Scaling	Hands-on with cut-outs and radial/circular grids exploring scale factor	CCSS 8.G.A.1	TI3, P4, DE4
3-5. Dilation on Grids and Coordinate Plane	Use square grids & coordinates for dilations	CCSS 8.G.A.1, 8.G.A.3	TCC2, DE4
6-9. Exploring Similarity	Compare polygons, define similarity, analyze ratio of sides	CCSS 8.G.A.2, 8.G.A.4, 8.G.A.5	CCE1, TCC2, CCE3, DE4
10-12. Slope via Similar Triangles	Use slope triangles to derive slope	CCSS 8.G.A.3, 8.EE.B.6, 8.G.A.4	TI3, TCC2, DE4, P3

Teacher Resources:

- Illustrative Mathematics Unit 2 Teacher Guide: detailed lesson narratives and alignment
- Family-facing video summaries (Vimeo/YouTube) explaining content and vocabulary
- Geometry toolkits: tracing paper, graph paper, ruler, protractor, patty paper (MP5 support)
- Digital tools: Desmos/GeoGebra for modeling dilations and slope triangles
- IXL
- Formative assessment protocols: exit tickets, partner critique, reflection prompts focused on transformations and slope reasoning

Unit 3 - Linear Relationships

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **CCSS 8.EE.B.5**: Graph proportional relationships and interpret the unit rate as the slope of the graph.
- **CCSS 8.EE.B.6**: Use similar triangles to explain why the slope m is the same between any two points on a non-vertical line in the coordinate plane
- **CCSS 8.F.B.4**: Construct and compare linear models and recognize solutions of a linear equation as points on its graph.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **TCC2**: I can evaluate data gathered from multiple perspectives and draw conclusions.
- **P4**: I can step outside my comfort zone because I recognize that my mistakes are not failures, but rather an opportunity to learn and grow. mistakes as opportunities to learn and grow.
- TI3: I can compose specific questions that are relevant to a task to support my learning.
- DE4: I can be respectful and responsible and build positive relationships with all members of the school community.
- **P3**: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that...	**Essential Questions:**
• A proportional relationship is a linear relationship whose graph	• How are proportional and linear relationships similar? How are

passes through the origin, with slope equal to the constant of proportionality. ● All linear relationships have a constant rate of change (slope); even non-proportional ones can be viewed as translated versions of proportional lines. ● The slope of a line represents how much y changes per unit change in x, and is consistent across any pair of points—established through similar triangles. ● The graph of a linear equation is the set of all its solutions, and each point corresponds to an input-output pair.	they different? ● In what ways does slope describe how a quantity changes? ● What does it mean to be a solution of a linear equation in two variables?
Students will know... ● Definitions: proportional relationship, linear relationship, rate of change, slope, vertical intercept, solution of an equation. ● How slope relates to constant rates and corresponding graph features. ● Translating a proportional line vertically creates a non-proportional linear relationship.	**Students will be able to...** ● Create and interpret graphs, tables, equations (y = mx + b) of proportional and linear relationships. ● Derive slope using similar triangles and calculate from two points. ● Determine whether a point is a solution to a given linear equation. ● Solve contextual problems involving linear growth or decay.
Key Vocabulary: Proportional relationship, Rate of change, Slope, Linear relationship, Vertical intercept (y-intercept), Similar triangles, Solutions / ordered pair	
Assessment Evidence	
Performance Tasks: **P4** & **P3** End of Unit Assessment ● Identifying points that lie on the graph of a linear equation. ● Interpreting graphs of real-world data and comparing rates of change. ● Writing equations for lines from graphs ● Finding the slope between two given points.	**Other Evidence:** Proportional Relationship Lines and Linear Equations FIAB Exit Tickets analyzing student learning and reflections Check Point Assessments Various Thinking Tasks using Building Thinking Classrooms instructional strategies.

• Comparing rates using a graph, an equation, and a table. • Creating a table to represent a linear relationship involving constraints. • Writing an equation to model the relationship between two variables. • Writing and graphing the linear equation. • Identifying whether the relationship is proportional. • Comparing and interpreting two different linear models	

Learning Plan

Lesson Focus	Activities	CCSS	VoL Attributes
Proportional Relationships	Compare graphs with different axis scales (e.g., ladybugs/ants), introduce rate of change.	8.EE.B.5	TI3, CCE3
Graphing Proportional Situations	Graph situations (e.g., Origami Car Wash); Info Gap task for axes decisions.	8.EE.B.5	TI3, CCE3
Non-Proportional / Linear Relationships	Stack cup data, compare to proportional model, observe vertical translation.	8.EE.B.6	TI3, P4, CCE3
Representations of Linear Relationships	Match contexts, tables, graphs with intercepts; craft equations.	8.F.B.4	CCE3
Finding & Calculating Slope	Work with positive & negative slopes; use slope triangles/off-grid coordinates.	8.EE.B.6	P4, CCE3, P3
Linear Equations & Solutions	Graph horizontal/vertical lines; explore solutions of 2 var equations.	8.F.B.4	TI3,CCE3, P3
Culminating-Problem Solving	Solve real-world linear problems with tables, graphs, and equations.	8.EE.B.5, 8.EE.B.6, 8.F.B.4	TI3, P4, CCE3, P3

Teacher Resources:

- Illustrative Mathematics Teacher Guide, Unit 3 (proportional and linear relationships)
- “Story of Unit 3” blog post explaining unit flow & key pedagogical choices
- Family-facing video summaries of each block (Vimeo/YouTube)
- Geometry toolkits: straightedges, protractors, colored pencils, graph paper
- Digital tools: Desmos or GeoGebra for dynamic slope & graphing practice
- IXL
- Formative assessment tools: exit tickets, card sorts, info-gap protocols, gallery walks

Unit 4 - Linear Equations and Linear Systems

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **8.EE.C.7**: Solve linear equations in one variable, including those with variables on both sides, and interpret solutions in context.
- **8.EE.C.8**: Analyze and solve pairs of simultaneous linear equations in two variables; understand solution sets.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- **TCC1**: I can ask relevant questions to evaluate possible solutions.
- TCC4: I can apply my learning to new experiences, determine if it works and adjust in the future.
- **CCE4**:I can express my thoughts and ideas, both verbally and in writing, in order to defend my perspective. I can do this via essays, performance based projects, whole group, and/or small group discussions.
- AA4: I can seek opportunities to learn more and continue to push my thinking.
- TI3: I can compose specific questions that are relevant to a task to support my learning.
- DE4: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that…

- Performing the same operation on both sides of an equation preserves equality (like balance scales).
- Linear equations in one variable may have no solution, exactly

Essential Questions:

- How do we maintain balance when solving equations—especially with variables on both sides?
- What strategies help us find all, some, or no solutions of a linear

one, or infinitely many; solution structure depends on equivalence of expressions. ● A point that solves both equations in a system lies at the intersection of their graphs; solving algebraically yields that intersection.	equation? ● How do we interpret and solve systems of linear equations graphically, algebraically, and in context?
Students will know… ● Techniques for solving equations: simplifying, combining like terms, using inverse operations, and balancing. ● Categories of equation outcomes: no solution, one solution, infinitely many. ● Methods for systems: graph intersection, substitution.	**Students will be able to...** ● Solve single-variable linear equations—including those with variables on both sides. ● Analyze an equation to classify its solution set (none, one, infinite). ● Solve systems of two linear equations using multiple strategies (graphically, algebraically). ● Apply solution methods in real-world context problems.
Key Vocabulary: variable, coefficient, constant, like terms, inverse operations, solution, no solution, infinite solutions, system of equations, solution of a system, substitution, intersection	
Assessment Evidence	
Performance Tasks: **TCC1** & **CCE4** Mid Unit Assessment ● Solve multi-step linear equations with variables on one or both sides ● Show all work and check solutions by substitution ● Determine whether a linear equation has: No solution,Exactly one solution, Infinitely many solutions ● Justify the type of solution based on simplification and comparison of both sides ● Solve a word problem involving comparing two linear cost models in a real world context ● Set up and solve a linear equation to determine when the two plans cost the same ● Interpret the solution in context	**Other Evidence:** Exit Tickets analyzing student learning and reflections Check Point Assessments Various Thinking Tasks solving systems using Building Thinking Classrooms instructional strategies.

Learning Plan

Lesson Focus	Activities	Standards	Vision Attributes
Number Puzzles & Balanced Moves	Solve/write puzzles using balance diagrams	8.EE.C.7	TI3, CCE3, DE4, P3
Keeping the Equation Balanced	Simplify and isolate variable steps	8.EE.C.7	CCE3, DE4, P3
Balanced Moves & Strategic Solving	Tackle multi-step equations with variables both sides	8.EE.C.7	TI3, CCE3, DE4, P3
Equations with All/No Solutions	Analyze situations leading to infinite or no solutions	8.EE.C.7	TCC1, TCC4, CCE3, CCE4, DE4, P3
Solving “How Many Solutions?”	Classify and justify solution types	8.EE.C.7	TCC1, TCC4, CCE3, CCE4, DE4, P3, AA4
Systems: On One or Both Lines	Solve via graph intersection and point identification	8.EE.C.8	TI3, TCC1, TCC4, CCE3, CCE4, DE4, P3, AA4
Solve Systems	Practice substitution and elimination methods	8.EE.C.8	TCC1, TCC4, CCE3, CCE4, DE4,P3, AA4

Teacher Resources:

- Illustrative Mathematics Unit 4 Teacher Guide – complete lesson narratives & standards]
- Family Lesson Videos (Solving equations & systems)—Vimeo/YouTube
- Balance diagrams & puzzle worksheets – analog tools for equation understanding
- Graph paper, rulers, calculators for systems instruction
- IXL

Unit 5 - Functions and Volume

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **8.F.A.1**: Understand a function as a rule that assigns to each input exactly one output.
- **8.F.A.2**: Compare properties of two functions represented in different ways.
- **8.F.B.4**: Construct linear functions; relate equation, graph, and table.
- **8.F.B.5**: Interpret the slope and intercept of graphs and tables in context.
- **G.GMD.A.3**: Use volume formulas for cylinders, cones, and spheres and understand relationships between their volumes and dimensions.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- **AA2**: I can identify past successful strategies and apply them independently.
- DE4: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- **CCE1**: I can contribute to discussions with my peers/teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully as I apply new knowledge to my thinking.
- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that…	**Essential Questions:**

• A function maps each input to exactly one output across representations . • For linear functions, slope and intercept are consistent and meaningful through graphs, tables, and equations • Volumes of cylinders, cones, and spheres change predictably with dimensions and can be modeled as functions • Volume formulas reveal relationships between dimensions: cylinder and prism; cone and cylinder; sphere as dimension scales	• What makes a rule a “function”? In what ways can we represent it? • How do change patterns in linear functions show themselves in graphs, tables, and equations? • How do measurements of three-dimensional figures change when dimensions change—what is the functional relationship?
Students will know... • Definitions: function, independent/dependent variables, slope, intercept, cylinder/cone/sphere volume formulas. • Ways to represent function: input-output tables, graphs, equations. • How dimensions affect volumes: $V = \pi r^2 h$, $V = (1/3)\pi r^2 h$, $V = (4/3)\pi r^3$	**Students will be able to…** • Determine if a rule defines a function and represent it across multiple formats. Derive linear equations from data; interpret slope and intercept in context. • Use and compare volume formulas; analyze how volume responds to changes in radius or height.
Key Vocabulary: Function, Input, Output, Function Notation, Linear Function, Nonlinear Function, Rate of Change, Constant Rate of Change, Volume, Cylinder, Cone, Sphere, Radius, Height, Volume Formulas, Equation	
Assessment Evidence	
Performance Tasks: **AA2 & CCE1** Summative Assessment • Recall and write the correct volume formulas for: Cylinder, Cone, and Sphere • Use given dimensions and apply appropriate formulas to: Find the volume of a cylinder, Find the volume of a cone, Find the volume of a sphere • Given the volume of a cylinder, work backwards to find the missing height using algebraic reasoning	**Other Evidence:** Exit Tickets analyzing student learning and reflections Check Point Assessments Various Thinking Tasks using Building Thinking Classrooms instructional strategies.

Learning Plan

Lesson Segment	Learning Activities	CCSS	Vision Traits
Inputs & Outputs	Explore input-output tables; define functions and understand functional relationships.	8.F.A.1	CCE1, CCE3, DE4
Function Representations	Match functions to their representations in tables, graphs, and equations; determine if relationships are linear or nonlinear.	8.F.A.2, 8.F.B.4, 8.F.B.5	CCE1, CCE3, DE4
Linear Function Patterns	Analyze slope and y-intercept in real-world contexts; model and explain increasing and decreasing patterns.	8.F.B.4, 8.F.B.5	CCE1, CCE3, DE4, P3
Cylinders & Cones	Investigate how volume changes with height and radius; derive volume formulas; represent relationships with functional graphs.	G.GMD.A.3	CCE1, CCE3, DE4, P3, AA2
Spheres & Scaling	Compare volumes of different solids; examine how volume scales with radius using function concepts.	G.GMD.A.3	CCE1, CCE3, DE4, P3, AA2

Teacher Resources:

- Illustrative Mathematics Unit 5 Teacher Guide (lesson narratives & standards
- Family-facing video summaries for each section (Inputs & Outputs; Functions; Solid Volumes)
- Geometry toolkits: tracing paper, graph paper, rulers, colored pencils, cylinders/prisms for volume exploration
- Volume formula reference & derivation aids (visual and symbolic)
- Digital modeling tools: Desmos/GeoGebra for exploring linear and volume functions
- IXL
- Formative assessments and protocols: exit tickets, peer critique, reflection prompts aligned to representations and function reasoning

Unit 6 - Associations in Data

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **8.SP.A.1–3: Construct and interpret scatter plots for paired numerical data; use association language like cluster, outlier, and trend.**
- **8.SP.A.4–5: Informally fit a line to scatter plots; use the fitted line to interpret and predict values.**
- **8.SP.B.4–5: Use two-way tables and segmented bar graphs to analyze categorical variable associations.**

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)\

- **TI3**: I can compose specific questions that are relevant to a task to support my learning.
- **DE4**: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that…

- Scatter plots reveal different association types—positive, negative, linear, or none—through clustering and outliers.
- Fitted lines summarize linear trends and enable informed predictions and over/under prediction evaluation.
- Two-way tables and segmented bar graphs help quantify and visualize categorical relationships using percentages.

Essential Questions:

- What kinds of associations can be shown in scatter plots?
- How can a fitted line reveal trends and support predictions?
- How can we use two-way tables and segmented bar graphs to describe associations in categorical data?

Students will know...	**Students will be able to....**
• Definitions: scatter plot, positive/negative/linear/nonlinear association, cluster, outlier, fitted line, prediction, residual, two-way table, segmented bar graph, relative frequency. • Different association types found in scatter plots • The purpose of two-way tables and segmented bar graphs for sharing data	• Construct and interpret scatter plots, describing association types using precise language. • Create and assess informal trend lines; use them to predict and evaluate predicted values. • Build two-way tables, segment bar graphs, compute relative frequencies, and evaluate categorical associations.

Key Vocabulary: Scatter Plot, Association, Positive Association, Negative Association, No Association, Linear Association, Nonlinear Association, Cluster, Outlier, Trend Line, Fitted Line, Prediction, Two-Way Table, Frequency, Relative Frequency, Segmented Bar Graph,Categorical Data, Numerical Data

Assessment Evidence

Performance Tasks: **TI3& DE4** Summative Assessment • Understanding and identifying associations in bivariate categorical data (e.g., recognizing associations using two-way tables) • Constructing and interpreting scatter plots for bivariate numerical data • Describing patterns, trends, clusters, and outliers in data • Drawing lines of fit and assessing their appropriateness • Using lines of fit to make predictions and interpret their meaning in context • Distinguishing between correlation and causation • Analyzing and interpreting real-world data situations involving bivariate data	**Other Evidence:** Various Thinking Tasks using Building Thinking Classrooms instructional strategies. Exit Tickets analyzing student learning and reflections Check Point Assessments

Learning Plan

Lesson	Activities	Standards	VoL Attributes
Organizing & Plotting Data	Sort messy data tables, create scatter	8.SP.A.1–2	TI3, DE4, CCE3

	plots.		
Interpreting Single Points & Clusters	Analyze coordinate points for meaning; label cluster, outlier.	8.SP.A.3	DE4, CCE3
Positive/Negative Associations	Compare real-world scatter plots (dogs, cars); describe association type.	8.SP.A.3	DE4, CCE3
Drawing Fitted Lines & Predictions	Draw trend lines, estimate missing y from x, identify over/under predictions.	8.SP.A.4	TI3, DE4, CCE3, P3
Evaluating Fit & Slope Meaning	Analyze how well lines fit; interpret steepness as rate.	8.SP.A.5	DE4, CCE3, P3
Clustering & Non-linear Patterns	Compare linear and non-linear scatter plots; explain differences.	8.SP.A.3, A.5	TI3, DE4, CCE3, P3
Categorical Associations	Collect categorical data, build two-way tables, compute relative frequencies.	8.SP.B.4	TI3, DE4, CCE3
Visualizing with Segmented Bar Graphs	Convert tables to segmented bars; analyze distribution.	8.SP.B.5	DE4, CCE3, P3
Culminating – “Gone in 30 Seconds”	Predict categorical outcomes using data; justify predictions.	All	DE4, CCE3, P3

Teacher Resources:

- Illustrative Mathematics Unit 6 Teacher Guide (narratives & standards)
- Family Lesson Video Summaries covering numerical & categorical associations
- Scatter plot & table construction toolkits: graph/grid paper, colored pencils
- Data collection kits: simple measuring tools or canned datasets
- Digital Tools: Desmos/GeoGebra for scatter plots and categorical charts
- IXL
- Formative Assessment Tools: exit tickets, data talk prompts, peer critique, reflection questions

Unit 7 - Exponents and Scientific Notation

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **8.EE.A.1**: Know and apply the properties of integer exponents to generate equivalent expressions (product, power of a power, quotient, zero, negative exponents)
- **8.EE.A.2**: Use scientific notation to express very large or very small numbers and perform operations with numbers written in scientific notation.
- **8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
- **8.EE.A.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- DE4: I can be respectful and responsible and build positive relationships with all members of the school community.
- **P3**: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- **CCE3**: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that…	**Essential Questions:**
• Exponent rules (e.g. x^a * x^b = x^(a + b); (x^a)^b = x^(a * b); x^0 = 1; x^(-a) = 1 / x^a) allow systematic manipulation of exponential expressions. • Negative and zero exponents naturally extend exponent concepts to include division and reciprocal relationships. • Scientific notation is a compact form using powers of ten that makes it easier to work with very large/small numbers, both conceptually and computationally.	• How do exponent rules help us simplify expressions and solve problems? • Why do negative and zero exponents make sense in terms of repeated multiplication/division? • When and why is scientific notation useful for representing extremely large or small numbers?
Students will know…	**Students will be able to...**
• Definitions of exponents (integer), exponent rules (product, power of a power, quotient, zero, negative), and scientific notation. • When and how to apply exponent rules to rewrite expressions. • How scientific notation expresses magnitude and supports calculations with large/small numbers.	• Apply exponent properties to simplify and rewrite expressions. • Interpret and simplify expressions with zero and negative exponents. • Convert numbers into and from scientific notation. • Multiply and divide in scientific notation; estimate using order of magnitude.
Key Vocabulary: Exponent, base, product rule, power of a power, quotient rule, zero exponent, negative exponent, scientific notation, order of magnitude, coefficient.	
Assessment Evidence	
Performance Tasks: **P3 & CCE3** Summative Assessment • Evaluate numeric expressions with positive and negative exponents • Demonstrate understanding of exponent meaning (e.g., 3^3, 5^-3) • Simplify expressions using properties of exponents:, Product of powers, Power of a power, Negative exponents • Writing as a single expression with a positive exponent only	**Other Evidence:** Various Thinking Tasks using Building Thinking Classrooms instructional strategies. Exit Tickets analyzing student learning and reflections Check Point Assessments

• Convert standard form numbers (very large and very small) into scientific notation • Apply correct format (significant figure × 10^exponent) • Convert from scientific notation into standard decimal form • Demonstrate understanding of powers of 10 and decimal placement	

Learning Plan

Lesson(s)	Learning Activities	Standards	Vision Traits
Exponent Review	Review whole-number exponents; connect repeated division to negative exponents	8.EE.A.1	DE4, P3, CCE3
Exponent Rules	Explore product, power-of-power, quotient rules through tables & pattern reasoning	8.EE.A.1	DE4, P3, CCE3
Zero & Negative Exponents	Reason through division patterns to understand x^0 and x^–n; apply to rational bases	8.EE.A.1	DE4, P3, CCE3
Powers of Ten	Multiply/divide large powers of ten; understand orders of magnitude	8.EE.A.1	DE4, P3, CCE3
Scientific Notation Intro	Convert numbers to/from scientific notation; place on number lines	8.EE.A.2	DE4, P3, CCE3
Operations in Sci. Notation	Practice multiplying/dividing scientific notation with estimation challenges	8.EE.A.2, 8.EE.A.3 , 8.EE.A.4	DE4, P3, CCE3

Teacher Resources:

- Illustrative Mathematics Unit 7 Teacher Guide (lesson narratives and pedagogy)
- Family-facing video summaries introducing exponent rules and scientific notation Student tools: calculators, exponent rule charts, scientific notation reference sheets

- IXL
  Formative tools: exit tickets on exponent simplification, mini-quizzes on notation conversion
  Visual aids: exponent laws posters and order-of-magnitude number line visuals

Unit 8 - Pythagorean Theorem and Irrational Numbers

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

- **8.G.B.6: Understand and use the Pythagorean Theorem to determine unknown side lengths in right triangles in contextual and coordinate settings.**
- **8.NS.A.2: Use rational approximations of irrational numbers to locate and compare them on the number line.**
- **8.EE.A.2: Perform arithmetic with numbers expressed in scientific notation, including operations with very large or very small values (supports understanding of irrational decimal representations)**

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **TCC2**: I can evaluate data gathered from multiple perspectives and draw conclusions.
- **TCC4**: I can apply my learning to new experiences, determine if it works and adjust in the future.
- DE4: I can be respectful and responsible and build positive relationships with all members of the school community.
- P3: I can receive and provide constructive feedback and understand the need to adjust my goals/learning journey.
- CCE3: I can participate in collaborative conversations by actively listening, formulating questions ,making connected comments and providing various types of feedback to my peers.

Understandings: Students will understand that…

- Proofs of the Pythagorean Theorem can be constructed both algebraically and geometrically by showing area equivalence.
- The set of real numbers includes irrational numbers (like $\sqrt{2}$)

Essential Questions:

- Why does $a^2 + b^2 = c^2$ for every right triangle?
- What differentiates rational from irrational numbers, and how can we estimate irrational values?

that cannot be expressed exactly as fractions or decimals. • Square roots and cube roots represent side or edge lengths in geometric contexts and often require irrational approximations. • The Pythagorean Theorem extends to coordinate geometry and three-dimensional right rectangular prisms.	• How can we use the Pythagorean Theorem across dimensions and coordinate systems?
Students will know... • Definitions: rational vs. irrational numbers; square root and cube root notation. • Two proofs of the Pythagorean Theorem—using algebraic argument and area decomposition. • How to use the Pythagorean Theorem in problem-solving across two and three dimensions.	**Students will be able to...** • Apply the Pythagorean Theorem to compute distances in right triangles (including 3D prism diagonals). • Justify the theorem using area-based reasoning or algebraic manipulation. • Classify and approximate irrational numbers (e.g., $\sqrt{10}$, $\sqrt{2}$, $\sqrt[3]{30}$) on the number line. • Approximate irrational results in context and compare their magnitudes relative to rational benchmarks.
Key Vocabulary: Pythagorean Theorem, hypotenuse, leg, square root, cube root, irrational number, rational number, approximate, square of a number, proof, coordinate distance, prism diagonal.	
Assessment Evidence	
Performance Tasks: **TCC2**: Evaluate data gathered from multiple perspectives and draw conclusions. **TCC4**: I can apply my learning to new experiences, determine if it works and adjust in the future. Summative Assessment • Calculate area given the side lengths of squares in different units (inches, units, cm). • Determine the side length of a square when given the area in	**Other Evidence:** Various Thinking Tasks using Building Thinking Classrooms instructional strategies. Exit Tickets analyzing student learning and reflections Check Point Assessments

various units. • Classify numbers as rational or irrational. • Identify two whole numbers between which a square root falls • Write the Pythagorean Theorem correctly. • Use the Pythagorean Theorem to find missing side lengths in right triangles • Apply the Pythagorean Theorem in a real-world context	

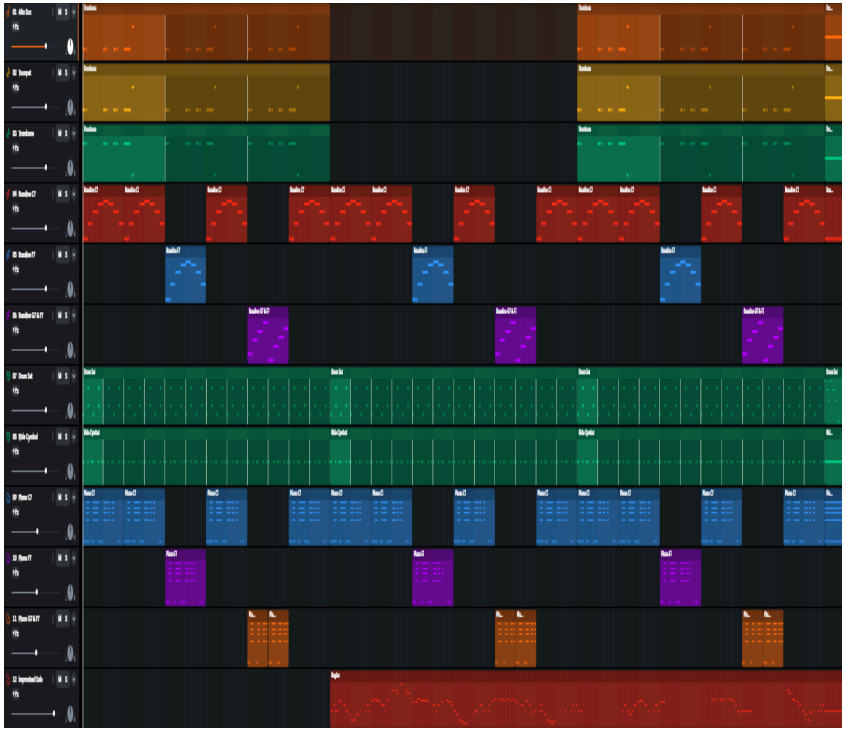
Learning Plan

Lessons	Activities	Standards	Vision Attributes
Square Area vs. Side Length	Explore area decomposition of tilted squares; introduce √n	8.NS.A.2	TCC2, DE4, CCE3
Number Line Placement of Roots	Sequence √n and ∛n using bounds; plot on number line	8.NS.A.2	TCC2, DE4, CCE3
Pythagorean Proofs	Conduct two Pythagorean Theorem proofs (algebraic and geometric)	8.G.B.6	DE4, CCE3
Applying the Theorem	Solve right triangle and coordinate distance problems	8.G.B.6	DE4, CCE3
Cube Roots & 3D Diagonals	Relate cube roots to volumes; explore 3D prism diagonals	8.NS.A.2, 8.G.B.6	TCC2, DE4, CCE3, P3
Decimal Representations & Irrationality	Explore decimal representations and irrational numbers (e.g., √2)	8.NS.A.2	DE4, CCE3, P3
Culminating – Real-World Problems	Apply Pythagorean and irrational approximations in real-world contexts	All	TCC2, DE4, CCE3, P3

Teacher Resources:

- Illustrative Mathematics Unit 8 Teacher Guide with lesson narratives & standards
- Family-Friendly Unit Videos on square roots, Pythagorean proofs, and approximations
- Geometric tools: square/rectangle manipulatives, draft paper for area proof activities
- Graph paper & calculators for plotting and distance computations
- IXL
- Formative assessments: exit tickets on plotting roots and approximation justification
- Proof scaffolds: graphic organizers for algebraic and geometric theorem proofs

8th Grade Digital Music Curriculum (60 Days)



Grade Level(s): 8

Curriculum Author(s): Jamie Odell

Course Description: Students in digital music focus on beginner piano fundamentals, review of music literacy fundamentals including; note duration, treble/bass clef note reading, time signatures. Students also focus on music technology, creating projects that demonstrate music concepts including: simple songs, ostinato, theme and variations, rounds, partner songs, 12-bar blues, and music of movies, television, and video games, along with DJ Compositions.

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner Attribute and Indicator**
Piano Basics and DAW Recording	"In what ways can performance and technology help us express musical ideas?"	Music is built on patterns of notes and rhythms that can be performed, recorded, and arranged using both instruments and technology.	TCC2(6-8); TCC3(6-8); TI2(6-8); TI4(6-8); AA1(6-8)
Theme and Variation	How can understanding musical notation help us create and perform music?	Musical ideas can be developed, transformed, and shared through an understanding of musical elements, structure, and technology.	TCC2(6-8); TCC3(6-8); TI2(6-8); TI4(6-8); AA1(6-8)
Music of Film, Television, and Gaming	How does music in film, television, and gaming enhance storytelling through performance, composition, and technology?	Music in visual media such as film, television, and gaming uses melody, harmony, and emotional expression to enhance storytelling, drawing on historical traditions, compositional techniques, and modern technology to create impactful audience experiences.	TCC2(6-8); TCC3(6-8); TI1(6-8); TI2(6-8); TI3(6-8); AA2(6-8); AA4(6-8)

Unit 1 - Piano Basics and DAW Recording

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

1. Students will develop fluency on the keyboard through proper technique and hand positioning**.**
   Aligned with: MU:Pr4.3 (Demonstrate understanding of musical concepts and structures when performing)
2. Students will identify and apply the layout of the keyboard, including chromatic notes, scales, and chords.
   Aligned with: MU:Cr2.1 (Organize and develop musical ideas and work)
3. Students will read and notate pitch on the treble clef staff, identifying line and space note names.
   Aligned with: NCAS MU:Pr4.2 (Demonstrate understanding of the structure and elements of music)
4. Students will read, perform, and create melodies using a variety of time signatures and rhythmic values.
   Aligned with: MU:Pr4.1 (Demonstrate and explain how the selection of music to perform is influenced by expressive intent and music literacy)
5. Students will compose and perform simple melodies using appropriate scales and rhythmic structure.
   Aligned with: MU:Cr1.1 (Generate and conceptualize artistic ideas and work)
6. Students will use a Digital Audio Workstation (DAW) to record, edit, and arrange their keyboard performances.
   Aligned with: MU:Cr3.1 (Evaluate and refine work) and MU:Pr6.1 (Convey meaning through the presentation of artistic work)*

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- **TCC4 (6–8):** *I can apply my learning to new experiences, determine if it works, and adjust in the future.*
- **TI2 (6–8):** *I can identify my objectives and apply the best resources to my learning.*
- **TI4 (6–8):** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
- **AA2 (6–8):** *I can identify past successful strategies and apply them independently.*
- **AA4 (6–8):** *I can seek opportunities to learn more and continue to push my thinking.*

Understandings: Students will understand that...

- The piano keyboard uses white and black keys to visually organize the 12 chromatic notes.
- Notes are organized into scales and chords.
- These scales are used to create melodies.

Essential Questions:

- How is the piano keyboard organized?
- What is the correct hand position for each tonality on the keyboard?
- How are notes organized on the treble clef?

• Melodies are written in specific time signatures to organize the rhythm. • The notes on the treble clef lines are E,G,B,D,F from bottom to top. • The notes on the treble clef spaces are F,A,C,E from bottom to top. • DAW is used to record and arrange student performances.	• How are notes organized to create melodies? • How are rhythms counted in different time signatures? • How can a Digital Audio Workstation be used to capture, edit, and arrange student performance?
Students will know… 1. MU:Cr1.1.8a rhythmic, melodic and harmonic phrases and harmonic accompaniments within expanded forms (including introductions, transitions, and codas) that convey expressive intent 2. MU:Cr2.1.8b standard and/or iconic notation and/or audio/video recording to document personal simple rhythmic phrases, melodic phrases, and harmonic sequences 3. MU:Pr6.1.8a technical accuracy, stylistic expression, and culturally authentic practices in music to convey the creator's intent.	**Students will be able to...** • Practice, perform, and record melodies and harmonic accompaniments in forms including strophic, aba, aaba, round, coda, etc. • Document their learning journey on piano by recording all rhythmic phrases, scales, melodies, harmonic sequences on their digital audio workstation (DAW). • Evaluate their recordings using criteria shared by the teacher and developed by themselves. • Sight-read rhythms, melodies, and harmonies in bass and treble clef. • Develop criteria to determine when they believe their piece is ready to be performed/recorded. • Perform their piece with the correct rhythm and notes while demonstrating attention to expression and cultural authenticity.

Key Vocabulary:

Staff	*Hand Position*	*Treble Clef*
Ledger Lines	*Fingering(s)*	*Rhythm*
Notes	*Time Signature*	*Melody*
Keyboard	*Scale*	*Repertoire*
Keys	*Chord*	*Genre*
Minor	*Roman Numerals*	*Digital Audio Workstation (DAW)*
Penta Scale	*Major*	*Musical Instrument Digital Interface (MIDI)*

Assessment Evidence	
Performance Tasks: • Perform examples of classroom repertoire ***TCC4; TI4*** • Recording examples of classroom repertoire in BandLab ***TCC4****:;* ***AA4; TI4***	**Other Evidence:** • Scale Check-ins(C Maj & Amin, C pentatonic) ***TI4; AA4*** • C Major Scale ***TI4; AA4*** • Chord Check-ins (I, IV, V in C Major) ***TI4; AA4***

Learning Plan

- Introduction to Digital Audio Workstation (DAW) – currently edu.BandLab.com
  - ***TI2:*** *I can identify my objectives and apply the best resources to my learning.*
- Keyboard Layout
  - ***AA2:*** *I can identify past successful strategies and apply them independently.*
- Hand Position & Finger Numbers
  - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
- Sight Reading in 2/4, 3/4, 4/4 Time Signature
  - ***TCC4:*** *I can apply my learning to new experiences, determine if it works, and adjust in the future.*
- C Penta Scale (both hands, test on preferred hand)
  - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
  - ***AA4:*** *I can seek opportunities to learn more and continue to push my thinking.*
- C Major Scale
  - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
  - ***AA4:*** *I can seek opportunities to learn more and continue to push my thinking.*
- A Natural Minor Scale
  - ***AA4:*** *I can seek opportunities to learn more and continue to push my thinking.*
  - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
- 3–4–5 Note Song
  - ***TCC4****: I can apply my learning to new experiences, determine if it works, and adjust in the future.*
  - ***AA4:*** *I can seek opportunities to learn more and continue to push my thinking.*
  - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*
- Treble Clef Note Reading
  - ***TI2:*** *I can identify my objectives and apply the best resources to my learning.*

Teacher Resources: *Keyboarding Slides; Repertoire for Keyboarding Unit; Lesson by Lesson Slideshow; Musictheory.net*

Unit 2 - Theme and Variation

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

1. Students will demonstrate the ability to craft and present original musical ideas that show unity and variety, tension and release, and expressive intent.
   Aligned with: MU:Cr3.2.8a (Present final version of personal composition using compositional techniques)
2. Students will perform and reflect on contrasting musical works, interpreting expressive qualities and explaining their musical decisions.
   Aligned with: MU:Pr4.3.8a (Perform contrasting pieces, explaining expressive intent)
3. Students will explore and perform music from diverse historical and cultural contexts, identifying how these contexts influence musical style and interpretation.
   Aligned with: MU:Pr4.2.8c (Identify how cultural/historical context informs performance)
4. Students will compare musical works from different periods and cultures, examining how time and place shape musical expression.
   Aligned with: MU:Re7.2.8b (Identify and compare the context of programs of music)
5. Students will develop and apply personal criteria to evaluate their own compositions and performances.
   Aligned with: MU:Re9.1.8a (Apply criteria to evaluate music and performance)
6. Students will connect music to other subjects and real-world experiences, drawing links through performance, composition, and discussion of context.
   Aligned with: MU:Cn11.0.8a (Demonstrate relationships between music, other disciplines, and daily life)

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC2: (6-8) *"I can evaluate data gathered from multiple perspectives and draw conclusions."*
- TCC3: (6-8) "*I can combine new information with my own ideas to generate solutions."*
- TI2: (6-8) *"I can identify my objectives and apply the best resources to my learning."*
- TI4 (6-8) *"I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed."*
- AA1 (6-8) *"I can implement different pathways to success and recognize the pros and cons of each."*

Understandings: Students will understand that…	**Essential Questions:**
• A theme is a melodic idea. • A variation changes that idea using different musical elements. • These musical elements can include; melody, harmony, rhythm, articulation, dynamics, orchestrations, tessitura, time signature, key signature, modality, etc. • Notes are organized into scales and chords. • These scales are used to create melodies including theme and variations. • The notes on the treble clef lines are E,G,B,D,F from bottom to top. • The notes on the treble clef spaces are F,A,C,E from bottom to top. • A DAW is used to record and arrange student performances.	• What is Theme & Variations? • What are some musical examples of Theme & Variations? • How can it be played rhythmically? • How can it be played melodically? • How can articulation, dynamics, orchestration, tessitura, tempo, modality, etc affect a variation? • What is the correct hand position for each tonality on the keyboard? • How are notes organized on the treble clef? • How can a Digital Audio Workstation be used to capture, edit, and arrange student performance?
Students will know…	**Students will be able to...**
• MU:Pr4.2.8c how cultural and historical context inform performance and results in different musical effects. • MU:Pr4.3.8a how the music's intent is conveyed by their interpretations of the elements of music and expressive qualities (such as dynamics, tempo, timbre, articulation/style, and phrasing). • MU:Re7.2.8b the context of programs of music from a variety of genres, cultures, and historical periods. • MU:Cn11.0.8a relationships between music and the other arts, other disciplines, varied contexts, and daily life.	• MU:Cr3.2.8a Present the final version of their documented personal composition, song, or arrangement, using craftsmanship and originality to demonstrate the application of compositional techniques for creating unity and variety, tension and release, and balance to convey expressive intent • play a variety of repertoire ranging in historical context from folk songs, classical as well as the blues. • perform contrasting pieces and share their reasoning for making musical choices. • compare the historical context of pieces throughout music history. • consider their own criteria when evaluating their own recordings. • make connections between music and other disciplines through historical context, listening examples and performing pieces of music from varied backgrounds.

Key Vocabulary:

Theme
Variation
Form
Treble Clef
Staff
Ledger Lines
Notes
Keyboard
Penta scale
Keys
Hand Position
Fingering(s)
Time Signature
Scale
Chord
Major
Minor
Rhythm
Melody
Articulation
Dynamics
Orchestration
Tessitura
Key Signature
Tempo
Modality
Repertoire
Modality
Repertoire
Genre
Digital Audio Workstation (DAW)
Musical Instrument Digital Interface (MIDI)
Quantize
Metronome
Beats Per Minute (BPM)

Assessment Evidence

Performance Tasks:

Identify musical form TCC2

Identifying themes in recorded music TCC2:

Perform and Original Theme TCC3

D Major Chord Check (I, IV, V) TI4

Practice/Perform D major scale and I, IV, V chord AA1:

Other Evidence:

MusicTheory.net- Treble clef note identification and keyboard note identification TI2:

D Pentatonic Scale Check-in TI4

B Natural Minor Scale Check-in TI4

Learning Plan

- MusicTheory.net – Treble clef note identification and keyboard note identification
  - ***TI2:*** *I can identify my objectives and apply the best resources to my learning.*
- Identify musical form
  - ***TCC2:*** *I can evaluate data gathered from multiple perspectives and draw conclusions.*
- Identifying themes in recorded music

    - ***TCC2:*** *I can evaluate data gathered from multiple perspectives and draw conclusions.*
- Perform theme
    - AA1: I can implement different pathways to success and recognize the pros and cons of each.
- Practice D major scale and I, IV, V chord
    - TI4: I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.
- Practice/Perform D Penta scale
    - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed*
    - ***AA1****: I can implement different pathways to success and recognize the pros and cons of each.*
- Practice/Perform D major scale and I, IV, V chord
    - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed*
    - ***AA1:*** *I can implement different pathways to success and recognize the pros and cons of each.*
- Practice rhythmic variations
    - ***TCC3:*** *I can combine new information with my own ideas to generate solutions.*\
- Practice B natural minor
    - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*Perform rhythmic variation
    - AA1: I can implement different pathways to success and recognize the pros and cons of each.
- Perform/Record B natural minor scale
    - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*Perform rhythmic variation
    - ***AA1:*** *I can implement different pathways to success and recognize the pros and cons of each.*
- Record melodic variation
    - ***AA1:*** *I can implement different pathways to success and recognize the pros and cons of each.*
    - ***TI4:*** *I can identify my strengths and areas for growth, set goals toward improvement, and seek support as needed.*Perform rhythmic variation
- Record variations based on articulation, dynamics, orchestration, tessitura, tempo, modality, etc.
    - ***AA1:*** *I can implement different pathways to success and recognize the pros and cons of each.*
    - ***TCC3:*** *I can combine new information with my own ideas to generate solutions.*

Teacher Resources: Lesson by Lesson Slideshow; Theme and Variation Quiz; Region 14 performance rubric; Musictheory.net

Unit 3 - Exploring Music of Film, Television, and Gaming

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

1. Students will explore the role of music in visual media and identify how it supports storytelling, mood, and emotional tone.
   MU:Re7.2.8b – Identify and compare the context of programs of music from a variety of genres, cultures, and historical periods.
2. Students will identify key composers and musical themes from the history of film, television, and gaming.
   MU:Cn11.0.8a – Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.
3. Students will compose original music for visual media using digital tools and musical elements that convey emotion and enhance storytelling.
   MU:Cr1.1.8a – Generate and conceptualize artistic ideas and work.
4. Students will organize and refine their musical ideas using appropriate compositional techniques, such as melody, harmony, dynamics, and form.
   MU:Cr2.1.8a – Organize and develop artistic ideas and work.
5. Students will evaluate and revise their compositions based on feedback and personal reflection to enhance expressive intent.
   MU:Cr3.1.8a – Evaluate and refine work.
6. Students will use a Digital Audio Workstation (DAW) to record, edit, and arrange music that synchronizes with visual media.
   MU:Pr6.1.8a – Convey meaning through the presentation of artistic work.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- **TCC2(6–8)**: "*I can evaluate data gathered from multiple perspectives and draw conclusions."*
- **TCC3(6–8)**: "*I can combine new information with my own ideas to generate solutions."*
- **TI1(6–8)**:" *I can create a plan with manageable steps to reach my goals."*
- **TI2(6–8)**: "*I can identify my objectives and apply the best resources to my learning."*.
- **TI3(6–8)**:" *I can compose specific questions that are relevant to a task to support my learning."*
- **AA2(6–8)**:" *I can identify past successful strategies and apply them independently"*

- **AA4(6–8)**:" *I can seek opportunities to learn more and continue to push my thinking."*

Understandings: Students will understand that… . ● Music plays a major role in film, television, and gaming. ● Many composers have made their living writing music for film, television, and gaming ● Music in visual media is rich in history dating back to silent film. ● Music in film, television, and gaming helps progress the story through emotional affect. ● Notes are organized into scales and chords. ● These scales are used to create melodies. ● DAW is used to record and arrange student performances.	**Essential Questions:** ● What role does music play in film, television, and gaming? ● Name some composers of film, television, and gaming. ● What are some famous themes from film, television and gaming? ● How does music convey emotion in film, television, and gaming? ● What is the correct hand position for each tonality on the keyboard? ● How are notes organized on the treble and bass clef? ● How can a Digital Audio Workstation be used to capture, edit, and arrange student performance?
Students will know… ● MU:Cr2.1.8b standard and/or iconic notation and/or audio/video recording to document personal simple rhythmic phrases, melodic phrases, and harmonic sequences ● MU:Cr3.1.8a appropriate application of compositional techniques, style, form, and use of sound sources. ● MU:Cr3.1.8b the rationale for refining works by explaining the choices, based on evaluation criteria. ● MU:Pr4.2.8a Compare the structure of contrasting pieces of music selected for performance, explaining how the elements of music are used in each ● MU:Pr4.2.8b When analyzing selected music, sight-read in treble or bass clef simple rhythmic, melodic, and/or harmonic notation ● MU:Pr4.3.8a Perform contrasting pieces of music, demonstrating as well as explaining how the music's intent is conveyed by their interpretations of the elements of music and expressive qualities (such as dynamics, tempo, timbre,	**Students will be able to…** ● practice, perform, and record these melodies and harmonic accompaniments with dynamics, articulation, etc to convey expressive intent. ● evaluate their recordings using criteria shared by the teacher and developed by themselves. ● make musical decisions in their recordings that others dislike. However, if the student can justify their decisions, the students' musical decisions are equally valid. ● Share their final version of student work is shared with the teacher (and oftentimes with the class) to demonstrate understanding of musical elements. ● play a variety of repertoire ranging in historical context from folk songs, classical as well as the blues. ● perform contrasting pieces and share their reasoning for making musical choices. ● compare the historical context of pieces throughout music history.

articulation/style, and phrasing).. • MU:Re9.1.8a Apply appropriate personally developed criteria to evaluate musical works or performances. • MU:Cn11.0.8a Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.	• consider their own criteria when evaluating their own recordings. • make connections between music and other disciplines through historical context, listening examples and performing pieces of music from varied backgrounds.

Key Vocabulary:

Media	Notes	Chord	Melody
Score	Keyboard	Major	Key Signature
Soundtrack	Keys	Minor	Tempo
Treble Clef	Hand Position	Penta scale	Repertoire
Bass Clef	Fingering(s)	Rhythm	Genre
Staff	Time Signature	Swing Rhythm	Digital Audio Workstation (DAW)
Ledger Lines	Scale		
Grand Staff			

Assessment Evidence

Performance Tasks: Music by popular film composers TCC2*;* TI3; AA4 Gaming Music Knowledge Check TCC2; TI3*;* AA4 2 Minute Original Film, TV, Gaming Composition*TCC3*	**Other Evidence:** MusicTheory.net – Treble and bass clef note identification and keyboard note identification (*TI2): .* B-flat Penta Scale Quiz *AA2* B-flat Chord Check-in *TI1* G Minor Scale Quiz *AA2*

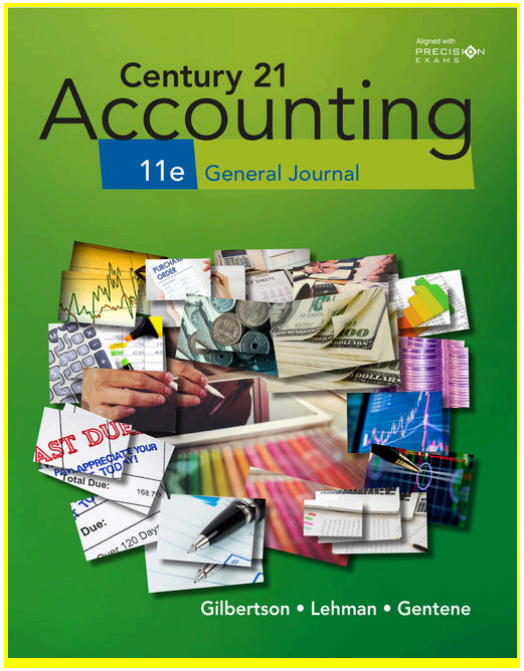
Learning Plan

- Assess treble & bass clef note reading
  - *AA2: I can identify past successful strategies and apply them independently.*

- Introduce music of visual media (Slideshow)
    - *TI2: I can identify my objectives and apply the best resources to my learning.*
- Introduce B-flat penta scale
    - *TI1: I can create a plan with manageable steps to reach my goals.*
- Assess B-flat penta scale
    - *AA2: I can identify past successful strategies and apply them independently.*
- Introduce B-flat major scale and I, IV, V chords
    - *TI1: I can create a plan with manageable steps to reach my goals.*
- Discuss popular film composers with listening, video, and sheet music examples
    - *TCC2: I can evaluate data gathered from multiple perspectives and draw conclusions.*
- Assess treble & bass clef note reading (again)
    - *AA2: I can identify past successful strategies and apply them independently.*
- Assess B-flat major scale and I, IV, V chords
    - *AA2: I can identify past successful strategies and apply them independently.*
- Introduce popular television composers with listening, video, and sheet music examples
    - *TCC2: I can evaluate data gathered from multiple perspectives and draw conclusions.*
- Review treble & bass clef note reading
    - *AA2: I can identify past successful strategies and apply them independently.*
- Discuss popular gaming composers with listening, video, and sheet music examples
    - *TCC2: I can evaluate data gathered from multiple perspectives and draw conclusions.*
- Assess G natural minor scale
    - *AA2: I can identify past successful strategies and apply them independently.*
- Repertoire selection from television or gaming (provided or researched)
    - *TI3: I can compose specific questions that are relevant to a task to support my learning.*
- Original TV, Film, or Game 2-minute composition
    - *TCC3: I can combine new information with my own ideas to generate solutions.*

Teacher Resources:
Lesson by Lesson Slideshow
Region 14 performance rubric
2 Minute Original Film, TV, Gaming Composition

ACCOUNTING 1 CURRICULUM



Grade Level(s): 9-12

Curriculum Author(s): Adam Lengyel

Course Description:
Students learn the basic accounting cycle for a service business organized as a proprietorship and a merchandise business organized as a corporation.. They learn to analyze transactions, enter them in general and special journals, and post them to ledgers. Practice is given in the preparation of worksheets and financial statements. This course also illustrates accounting for personal use, such as checking accounts and bank reconciliations. Evaluation includes application problems, tests and simulations. Google Sheets and online simulations are utilized extensively throughout this course for purposes of journalizing and preparing financial statements. Accounting is recommended for all students planning to pursue business studies and those students enrolled in the Vocational Agriculture Program.

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Accounting for a Service Business Organized as a Proprietorship Part 1	How do businesses begin the process of tracking financial transactions?	Foundational accounting concepts help organize and record financial information systematically.	TCC1(9-12), CCE1(9-12), P1(9-12)
Accounting for a Service Business Organized as a Proprietorship Part 2	How do businesses complete the accounting cycle and prepare accurate financial reports?	Completing the accounting cycle ensures financial accuracy, compliance, and informed business decisions.	TCC3 (9-12), CCE4 (9-12), TI1 (9-12)
Accounting for a Merchandising Business Organized as Corporation Part 1	How do businesses efficiently record purchases, sales, and payroll transactions?	Specialized journals and payroll procedures enhance accuracy and streamline financial reporting.	TCC2 (9-12), CCE2 (9-12), AA1 (9-12)
Accounting for a Merchandising Business Organized as Corporation Part 2	How do businesses account for payroll taxes, dividends, and prepare worksheets for corporations?	Corporate and payroll accounting practices ensure legal compliance and inform financial decisions at the organizational level.	TCC4 (9-12), TI2 (9-12), P3 (9-12)

Unit 1-Accounting for a Service Business Organized as a Proprietorship Part 1

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
1.1 Understand the role of accounting in business.
1.2 Identify career opportunities in accounting.
1.3 Demonstrate ethical behavior in accounting.
1.4 Apply the accounting equation.
1.5 Journalize financial transactions.
1.6 Post journal entries to a general ledger.

Vision of A Learner Attributes:
TCC1(9-12): I can ask purposeful questions.
CCE1(9-12): I can initiate discussions and respect differing viewpoints.
P1(9-12): I can reflect and build upon strengths.

Understandings: Students will understand that…

- The accounting equation is the foundation for recording transactions.
- Journalizing and posting entries are core skills in the accounting process.
- Ethical practices are essential in financial decision-making.

Essential Questions:

- What role does the accounting equation play in financial management?
- How are transactions journalized and posted in an organized system?
- Why is ethical behavior critical in accounting?

Students will know...

- Key components of the accounting equation.
- How to analyze transactions into debit and credit parts.
- How to journalize and post transactions.

Students will be able to...

- Apply the accounting equation to business transactions.
- Journalize transactions using source documents.
- Post transactions from a journal to a general ledger.

Key Vocabulary: Accounting equation, assets, liabilities, owner's equity, debit, credit, journal, ledger, source document, posting.

Assessment Evidence	
Performance Tasks: Ch 1: ● Completing the accounting equation ● Determining how transactions change an accounting equation ● Determining how revenue, expense, and withdrawal transactions change an accounting equation Ch 2: ● Determining the normal balance and increase and decrease sides for accounts ● Analyzing transactions into debit and credit parts ● Analyzing revenue, expense, and withdrawal transactions into debit and credit parts Ch 3: ● Journalizing transactions in a five-column journal ● Journalizing buying insurance, buying on account, and paying on account in a five-column journal ● Journalizing transactions that affect owner's equity and receiving cash on account in a five-column journal ● Proving and ruling a journal Ch 4: ● Preparing a chart of accounts and opening an account ● Posting separate amounts to a general ledger ● Posting column totals to a general ledger ● Journalizing correcting entries In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: ● Work Together and OnYour Own Problems ● Application Problems ● Recycling Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests

Learning Plan
● Chapter 1: Explore changes that affect the accounting equation (TCC1). ● Chapter 2: Analyze transactions into debit and credit parts (CCE1). ● Chapter 3: Journalize transactions with source documents (TCC4).

- Chapter 4: Post to a general ledger and complete correcting entries (P1).
- Group discussion and collaborative problem-solving activities (CCE3).

Teacher Resources:

- Century 21 Accounting textbook and teacher's edition.
- Chapter PowerPoints and guided notes.
- Online resources from C21Accounting.com.
- Supplemental practice sets and worksheets.
- Google sheets/Excel working papers

Unit 2 -Accounting for a Service Business Organized as a Proprietorship Part 2

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
2.1 Maintain cash control systems.
2.2 Prepare worksheets for financial adjustments.
2.3 Generate financial statements for a sole proprietorship.
2.4 Record adjusting and closing entries.

Vision of A Learner Attributes:

TCC3 (9-12): I can integrate relevant information to produce multiple valid solutions.
CCE4 (9-12): I can communicate my understanding authentically and respectfully.
TI1 (9-12): I can implement a plan and adapt when necessary to achieve my goals.

Understandings: Students will understand that...

- Cash control systems are essential for safeguarding business assets.
- A worksheet helps organize adjustments and prepare financial statements.
- Accurate financial statements support decision-making and business growth.
- Adjusting and closing entries complete the accounting cycle.

Essential Questions:

- How do cash control systems contribute to financial security?
- What role does a work sheet play in financial reporting?
- Why are adjusting and closing entries vital to the accounting cycle?

Students will know...

- Procedures for reconciling bank statements and maintaining petty cash.
- Steps to prepare a worksheet for a service business.

Students will be able to...

- Prepare a bank reconciliation and manage petty cash transactions.
- Create and extend work sheets for financial statement

• How to complete financial statements from worksheet data. • How to record adjusting and closing entries.	preparation. • Draft an income statement and balance sheet. • Record adjusting and closing entries accurately.
Key Vocabulary: Bank reconciliation, petty cash, worksheet, adjustments, income statement, balance sheet, adjusting entries, closing entries.	
Assessment Evidence	
Performance Tasks: Ch 5: • Endorsing and writing checks • Reconciling a bank statement and recording a bank service charge • Recording dishonored checks, electronic funds transfers, and debit card purchases • Establishing and replenishing a petty cash fund Ch 6: • Recording the trial balance on a work sheet • Planning adjustments on a work sheet • Completing a work sheet • Finding and correcting errors in accounting records Ch 7: • Preparing an income statement • Preparing a balance sheet • Preparing financial statements with a net loss Ch 8: • Journalizing and posting adjusting entries • Journalizing and posting closing entries • Preparing a post-closing trial balance In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: • Work Together and OnYour Own Problems • Application Problems • Recycling Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests MidTerm Exam: Reinforcement Activity 1 Part A & B
Learning Plan	

- Chapter 5: Cash control systems and bank reconciliations (TCC3, TI1).
- Chapter 6: Creating worksheets and planning adjustments (CCE4).
- Chapter 7: Preparing income statements and balance sheets (TCC3).
- Chapter 8: Recording adjusting and closing entries (TI1, P3).
- Collaborative case studies on end-of-cycle financial activities (CCE4, TCC4).

Teacher Resources:

- Century 21 Accounting textbook and teacher resources.
- C21Accounting.com interactive tools.
- Chapter-based PowerPoints and guided notes.
- Real-world financial statement samples for analysis.
- Google sheets/Excel working papers

Unit 3- Accounting for a Merchandising Business Organized as Corporation Part 1

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
3.1 Record purchases and payments in specialized journals.
3.2 Record sales and cash receipts in specialized journals.
3.3 Post transactions to subsidiary ledgers.
3.4 Prepare payroll records and related tax forms.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC2 (9-12): I can evaluate evidence and recognize implications to justify conclusions.
- CCE2 (9-12): I can give and receive actionable feedback for revisions.
- AA1 (9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...

- Specialized journals simplify recording repetitive transactions.
- Subsidiary ledgers provide detailed records of accounts payable and receivable.
- Accurate payroll records ensure proper compensation and tax compliance.
- Integration of these practices supports efficient business operations.

Essential Questions:

- How do specialized journals improve the efficiency of accounting processes?
- Why are subsidiary ledgers necessary for large-scale operations?
- What are the key components of accurate payroll accounting?

Students will know...

- Procedures for recording purchases, payments, sales, and cash receipts.
- How to post transactions to subsidiary ledgers.

Students will be able to...

- Record transactions in purchases, cash payments, sales, and cash receipts journals.
- Post to accounts payable and accounts receivable ledgers.
- Calculate gross pay, taxes, and net pay and complete payroll

• Payroll calculation methods and tax requirements.	records.
Key Vocabulary: Purchases journal, cash payments journal, sales journal, cash receipts journal, subsidiary ledger, payroll register, withholding, net pay, employer payroll taxes.	
Assessment Evidence	
Performance Tasks: Ch 9: • Journalizing purchases using a purchases journal • Journalizing cash payments using a cash payments journal • Preparing a petty cash report • Performing additional cash payments journal operations • Journalizing other transactions using a general journal Ch 10: • Journalizing sales on account; proving and ruling a sales journal • Journalizing cash receipts; proving and ruling a cash receipts journal • Journalizing sales returns and allowances using a general journal Ch 11: • Posting to an accounts payable ledger • Posting to an accounts receivable ledger • Posting to a general ledger • Posting special journal column totals to a general ledger • Journalizing and posting correcting entries affecting customer accounts Ch 12: • Preparing payroll time cards • Determining payroll tax withholding • Preparing a payroll register • Preparing an employee earnings record • Preparing payroll checks In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: • Work Together and OnYour Own Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests

• Application Problems • Recycling Problems	

Learning Plan

- Chapter 9: Journalizing purchases and cash payments (TCC2, AA1).
- Chapter 10: Journalizing sales and cash receipts (CCE2).
- Chapter 11: Posting to general and subsidiary ledgers (TCC2, AA1).
- Chapter 12: Preparing payroll records and payroll tax reports (CCE2, TI4).
- Group exercises in payroll tax calculations and reporting (CCE3).

Teacher Resources:

- Century 21 Accounting textbook and teacher materials.
- C21Accounting.com payroll simulations.
- Payroll tax forms and IRS website references.
- Sample business cases for applied learning.
- Google sheets/Excel working papers

Unit 4 - Accounting for a Merchandising Business Organized as Corporation Part 2

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
4.1 Record payroll taxes and prepare required reports.
4.2 Understand employer payroll tax obligations.
4.3 Distribute corporate earnings and dividends.
4.4 Complete work sheets for a merchandising business organized as a corporation.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC4 (9-12): I can integrate learning and adapt to new experiences in the classroom and beyond.
- TI2 (9-12): I can evaluate objectives and resources to find the best solutions.
- P3 (9-12): I can use setbacks to adjust my learning and improve.

Understandings: Students will understand that...

- Payroll tax reporting is a critical business function requiring accuracy and timeliness.
- Corporations distribute dividends and must record these transactions properly.
- Worksheets for corporations help plan financial adjustments and prepare financial statements.

Essential Questions:

- Why is payroll tax reporting crucial to business operations?
- How do corporations record dividend distributions and other equity transactions?
- What role do work sheets play in corporate financial reporting?

Students will know...

- The process for recording and reporting payroll taxes.
- Corporate accounting procedures for dividends and earnings distribution.
- How to prepare corporate worksheets.

Students will be able to...

- Record and report employer payroll taxes accurately.
- Journalize the distribution of dividends and earnings.
- Prepare and complete work sheets for a merchandising business.

Key Vocabulary: Employer payroll taxes, payroll reports, dividends, retained earnings, capital stock, corporation, worksheet.

Assessment Evidence

Performance Tasks:
Ch 13-16:
Ch 13:
- Recording a payroll
- Recording employer payroll taxes
- Reporting withholding and payroll taxes
- Paying withholding and payroll taxes

Ch 14:
- Journalizing dividends
- Beginning an 8-column work sheet for a merchandising business
- Analyzing and recording a merchandise inventory adjustment on a work sheet
- Analyzing and recording an allowance for uncollectible accounts adjustment on a work sheet
- Planning and recording adjustments for depreciation
- Calculating federal income tax and completing an 8-column work sheet for a merchandising business

Ch 15:
- Preparing an income statement for a merchandising business
- Analyzing component percentages and financial ratios
- Preparing a statement of stockholders' equity
- Preparing a balance sheet for a corporation

Ch 16:
- Journalizing adjusting entries
- Journalizing closing entries
- Preparing a post-closing trial balance

In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above:
- Work Together and OnYour Own Problems
- Application Problems
- Recycling Problems

Other Evidence:
Interim:
Mastery Problems
Assessments:
Chapter Tests
Final Exam:
Reinforcement Activity 2 Part A & B

Learning Plan

- Chapter 13: Payroll accounting, taxes, and reporting (TCC4, TI2).
- Chapter 14: Distributing corporate earnings and dividends (P3, TCC4).
- Chapter 15: Preparing corporate worksheets (TI2, CCE4).
- Chapter 16: Financial statements for corporations (CCE3, TCC4).
- Collaborative analysis of corporate financial scenarios.

Teacher Resources:

- Century 21 Accounting textbook and teacher resources.
- IRS website for payroll tax guidelines.
- Corporate financial statement examples.
- C21Accounting.com simulations and digital exercises.
- Google sheets/Excel working papers

ACCOUNTING 2 CURRICULUM

Grade Level(s):10-12	**Curriculum Author(s):** Adam Lengyel

Course Description:
This advanced high school accounting course provides students with comprehensive knowledge and applied skills in accounting for plant assets, depreciation, corporate financial adjustments, partnership accounting, and digital accounting technology. Using the Century 21 Accounting: Multicolumn Journal and QuickBooks Online, students will explore and perform complex transactions and fiscal procedures. The curriculum emphasizes critical thinking, collaborative learning, and real-world business applications. Students will advance their understanding through hands-on simulations, financial statement preparation, and culminate with an industry-recognized QuickBooks Online certification.

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Accounting for Plant Assets and Depreciation	How do businesses account for long-term assets, depreciation, and inventory adjustments?	| Accurate accounting for plant assets, depreciation, and inventory ensures clear financial reporting and asset management.	TCC1(9-12), CCE2(9-12), TI3(9-12), AA1(9-12)
Financial Reporting and Corporate Adjustments	How do corporations prepare and adjust financial records for accurate reporting?	Mastery of corporate financial reporting and adjustments enhances accuracy and provides valuable insights for decision-making.	TCC4 (9-12), AA3 (9-12), CCE3 (9-12)
Partnerships and Fiscal Period Procedures	How do partnerships handle accounting procedures and complete fiscal period activities?	Understanding partnership accounting and fiscal adjustments ensures transparency, accuracy, and equitable financial reporting among partners.	TCC3 (9-12), CCE2 (9-12), AA1 (9-12)
QuickBooks Online Certification (Beginner Track)	How do businesses use digital accounting software to manage service, product, and project-based business transactions?	Mastering digital accounting software builds real-world business readiness and supports efficient financial management.	TI4 (9-12), CCE4 (9-12), AA1 (9-12)

Unit 1 - Accounting for Plant Assets and Depreciation

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
1.1 Account for the acquisition, depreciation, and disposal of plant assets.
1.2 Record adjusting entries for uncollectible accounts and inventory adjustments.
1.3 Analyze inventory using different valuation methods.
1.4 Understand and record depreciation methods and their impact on financial statements.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.
CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.
TI3(9-12): I can formulate and investigate probing questions to further my learning.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...

- Plant assets must be recorded, depreciated, and disposed of according to accounting principles.
- Depreciation impacts both the balance sheet and income statement.
- Uncollectible accounts and inventory adjustments are necessary for accurate financial statements.

Essential Questions:

- How do businesses track and account for plant assets and depreciation?
- Why are adjustments for uncollectible accounts important?
- What methods are used to value and adjust inventory?

Students will know...

- Procedures for accounting for plant assets and depreciation.
- Methods for estimating and recording uncollectible accounts.
- Inventory valuation methods (FIFO, LIFO, Weighted Average).

Students will be able to...

- Record acquisition and disposal of plant assets.
- Calculate and journalize depreciation using multiple methods.
- Record adjusting entries for uncollectible accounts and

• How asset management impacts financial statements.	inventory valuation. • Analyze financial statement impacts of asset and inventory decisions.
Key Vocabulary: Plant assets, depreciation, straight-line depreciation, declining balance depreciation, uncollectible accounts, allowance method, FIFO, LIFO, weighted average.	
Assessment Evidence	
Performance Tasks: Ch 17: • Estimating and journalizing entries for uncollectible accounts expense • Recording entries related to uncollectible accounts Ch 18: • Journalizing buying plant assets and paying property tax • Calculating straight-line depreciation • Preparing plant asset records • Journalizing annual depreciation expense • Recording the disposal of plant assets • Calculating depreciation using the double declining-balance depreciation method Ch 19: • Preparing a stock record • Determining the cost of inventory using the fifo, lifo, and weighted-average inventory costing methods • Estimating ending inventory using the gross profit method Ch 20: • Calculating interest, maturity dates, and maturity values for promissory notes • Journalizing notes payable transactions • Journalizing notes receivable transactions In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: • Work Together and OnYour Own Problems • Application Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests

• Recycling Problems	

Learning Plan

- Chapter 17: Accounting for plant assets and depreciation methods (TCC2, TI4).
- Chapter 18: Adjusting entries for uncollectible accounts (CCE3).
- Chapter 19: Inventory valuation methods and adjustments (TCC2).
- Chapter 20: Asset disposal and financial statement impact (CCE3, TI4).
- Collaborative financial scenario analysis.

Teacher Resources:

- Century 21 Accounting textbook and teacher's edition.
- Inventory valuation examples.
- C21Accounting.com practice simulations and digital resources.
- Google sheets/Excel working papers

Unit 2 - Financial Reporting and Corporate Adjustments

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
2.1 Prepare corporate financial statements and end-of-fiscal-year adjustments.
2.2 Journalize and post transactions for corporations.
2.3 Complete corporate closing entries and post-closing trial balances.
2.4 Understand the role of adjustments in corporate financial health.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC4 (9-12): I can integrate learning and adapt to new experiences in the classroom and beyond.
- AA3 (9-12): I can consider multiple perspectives and use them to make informed decisions.
- CCE3 (9-12): I can show initiative in group collaboration and professional communication.

Understandings: Students will understand that...

- Corporate financial statements require detailed adjustments and closing entries.
- Proper corporate adjustments ensure financial accuracy and compliance.
- Understanding post-closing procedures enhances financial statement interpretation.

Essential Questions:

- What steps are involved in preparing financial statements for corporations?
- How do adjustments and closing entries ensure the accuracy of corporate financial records?
- Why is the post-closing trial balance an essential part of the accounting cycle?

Students will know...

- The process of preparing corporate income statements and balance sheets.
- The purpose and procedures for closing entries in corporate accounting.
- The role of post-closing trial balances in verifying ledger

Students will be able to...

- Prepare and adjust corporate financial statements.
- Complete closing entries and post them to the general ledger.
- Create a post-closing trial balance and analyze results.

accuracy.	

Key Vocabulary: Corporate adjustments, closing entries, retained earnings, income summary, post-closing trial balance, stockholders' equity.

Assessment Evidence

Performance Tasks: Ch 21: ● Journalizing and posting entries for accrued revenue ● Journalizing and posting entries for accrued expenses Ch 22: ● Preparing a work sheet for a corporation ● Preparing an income statement for a corporation ● Preparing a statement of stockholders' equity and balance sheet for a corporation ● Journalizing adjusting, closing, and reversing entries for a corporation In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: ● Work Together and OnYour Own Problems ● Application Problems ● Recycling Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests Midterm Exam: Reinforcement Activity 3 Part A & B

Learning Plan

- Chapter 21: Corporate financial statement preparation and adjustments (TCC4, AA3).
- Chapter 22: Closing entries and post-closing trial balance (CCE3, TCC4).
- Group-based activities on corporate end-of-year financial processes.
- Case studies in corporate financial decision-making.

Teacher Resources:

- Century 21 Accounting textbook and teacher's edition
- Sample corporate financial statements and ledgers
- Practice templates from C21Accounting.com
- Google sheets/Excel working papers

Unit 3 - Partnerships and Fiscal Period Procedures

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
3.1 Record transactions for partnership formation, changes, and dissolution.
3.2 Prepare financial statements for partnerships.
3.3 Complete fiscal period closing procedures for partnerships.
3.4 Understand equity distribution and adjustments among partners.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC3 (9-12): I can integrate relevant information and produce valid conclusions.
- CCE2 (9-12): I can give and receive constructive feedback and revise my work.
- AA1 (9-12): I can evaluate multiple approaches and justify the best solution.

Understandings: Students will understand that...

- Partnership accounting involves unique transactions for equity, profit sharing, and dissolution.
- Fiscal period procedures ensure accuracy and fairness in partnership financial reporting.
- Equitable distribution of profits and losses is key to maintaining partnership integrity.

Essential Questions:

- How are financial transactions recorded and adjusted for partnerships?
- What are the key fiscal period procedures for partnerships?
- How do partners equitably distribute profits and losses?

Students will know...

- Procedures for partnership formation and equity adjustments.
- Fiscal period activities for partnership accounting.
- How to prepare partnership financial statements.

Students will be able to...

- Record partnership transactions and changes in partner equity.
- Prepare financial statements for a partnership.
- Complete fiscal closing entries and post-closing trial balances.

Key Vocabulary: Partnership equity, profit and loss distribution, partnership dissolution, partner capital account, drawing account, partnership

agreement.

Assessment Evidence	
Performance Tasks: Ch 23: ● Journalizing partners' investments and withdrawals ● Preparing distribution of net income and owners' equity statements (net income) ● Preparing an owners' equity statement (net loss) ● Liquidating a partnership Ch 24: ● Journalizing international sales transactions ● Journalizing Internet sales transactions In each chapter students are completing the following problems to reinforce understanding of each of the performance tasks listed above: ● Work Together and OnYour Own Problems ● Application Problems ● Recycling Problems	**Other Evidence:** Interim: Mastery Problems Assessments: Chapter Tests

Learning Plan

- Chapter 23: Partnership formation and financial transactions (TCC3, AA1).
- Chapter 24: Fiscal period procedures and financial reporting for partnerships (CCE2, TCC3).
- Collaborative case studies on partnership profit distribution and dissolution.
- Peer feedback and revision activities.

Teacher Resources:

- Century 21 Accounting textbook and teacher's edition
- Practice simulations from C21Accounting.com
- Google sheets/Excel working papers

Unit 4 - QuickBooks Online Certification (Beginner Track)

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

NBEA Standards:
4.1 Apply accounting knowledge in digital environments.
4.2 Manage and record transactions for service-based businesses using QuickBooks.
4.3 Expand functionality to include product-based and project-based business applications.
4.4 Demonstrate proficiency through certification-level tasks.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TI4 (9-12): I can apply my strengths and anticipate challenges to achieve my goals.
- CCE4 (9-12): I can communicate solutions using professional digital tools.
- AA1 (9-12): I can evaluate and adjust to new technology and workflows.

Understandings: Students will understand that...

- QuickBooks Online is a key tool for real-world financial management.
- Service, product, and project-based business models require specific accounting practices.
- Certification demonstrates readiness to apply accounting skills in professional settings.

Essential Questions:

- How does QuickBooks Online support financial management for different business types?
- What are the core functions of QuickBooks for service, product, and project-based transactions?
- How does certification demonstrate readiness for workplace applications?

Students will know...

- Basic to advanced QuickBooks functions for various business models.
- How to create, manage, and report business transactions digitally.
- The steps required to complete QuickBooks certification.

Students will be able to...

- Navigate and utilize QuickBooks Online for service-based business functions (Level 1).
- Expand to product-based business functions including inventory and reporting (Level 2).
- Manage project-based financials and reporting tasks (Level 3).

	• Complete certification-level tasks and demonstrate proficiency.
Key Vocabulary: Chart of accounts, bank feeds, invoices, payments, reconciliation, product tracking, project management, reporting tools, digital financial statements.	
Assessment Evidence	
Performance Tasks: • Complete simulations for service-based business financials using QuickBooks. • Demonstrate skills for product-based and project-based business scenarios in the software.	**Other Evidence:** • Checkpoint quizzes for each QuickBooks level. • Collaborative problem-solving exercises with digital financial reporting. • Reflection assignments on digital accounting practices.
Learning Plan	
• Level 1: Service-based business fundamentals (6+ hours) (TI4, AA1). • Level 2: Product-based business applications (20+ hours) (CCE4). • Level 3: Project-based financial management (24+ hours) (TI4, CCE4). • Group collaboration and peer review of QuickBooks projects. • Completion of QuickBooks Online certification exam.	
Teacher Resources: • QuickBooks Online Educator Resources • Intuit Certified QuickBooks Online training materials • Access to student practice portals and tutorials • Sample business templates and use-case scenarios for digital accounting	

Marketing II CURRICULUM

NONNEWAUG HIGH SCHOOL DECA™	REGION 14 SCHOOL DISTRICT — VISION OF A LEARNER
Grade Level(s): 10-12	**Curriculum Author(s):** Devon Bares
Course Description: This course will cover Advanced Marketing topics including management, leadership, the supply chain, market research, pricing and entrepreneurship. Students will develop a number of real world business proposals and explore the ever-changing environment of business in the 21st century. The class will include the development of a business consultation or proposal that will be presented at the DECA State Career Development Conference. In addition, students will continue to have the opportunity to take an active role in the school's chapter of DECA as well as the daily operations of the Nonnewaug School Store. Students may contract for an honors level course experience.	

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Skills for Marketing	What foundational skills are necessary for success in marketing?	Strong marketing professionals possess a blend of technical, analytical, and interpersonal skills to drive business success.	TCC1:9-12, CCE1:9-12, TI1:9-12
Distribution	How do businesses efficiently get products to consumers?	Distribution channels impact product availability, pricing, and customer satisfaction.	TCC3:9-12, AA2:9-12, CCE3:9-12
DECA Competitive Events	How can competitive marketing strategies be applied to real-world business scenarios?	Participation in competitions enhances critical thinking, problem-solving, and leadership skills.	TI4:9-12, P3:9-12, CCE2:9-12
Pricing	How does pricing influence consumer behavior and business profitability?	Effective pricing strategies balance consumer perception, competition, and profitability.	TCC2:9-12, CCE4:9-12, AA1:9-12
Marketing Information Management	How do businesses use data to make marketing decisions?	Data-driven decision-making improves marketing effectiveness and customer engagement.	TCC3:9-12, TI2:9-12, P4:9-12
Product/Service Management	How do businesses develop, maintain, and improve their products/services?	Successful businesses continuously innovate and adapt to consumer needs.	AA3:9-12, TCC4:9-12, TI3:9-12

Unit 1 - Skills for Marketing

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Communication, Management, Leadership Skills
Analyze company resources to ascertain policies and procedures (CO:057) (CS)
Explain communication techniques that support and encourage a speaker (CO:082) (PQ)
Demonstrate active listening skills (CO:017, LAP-CO-017) (PQ)
Interpret others' nonverbal cues (CO:059) (PQ)
Employ communication styles appropriate to target audience (CO:084) (CS)
Make oral presentations (CO:025, LAP-CO-025) (SP)
Select and use appropriate graphic aids (CO:087) (CS)
Explain the nature of staff communication (CO:014) (CS)
Choose and use appropriate channel for workplace communication (CO:092) (CS)
Orient new employees (HR:360) (CS)
Explain the role of training (HR:362) (SU)
Explain the nature of management/supervisory training (HR:363) (SU)
Explain the nature of leadership in organizations (HR:493, LAP-HR-493) (SU)
Describe ways that businesses build positive employer-employee relationships (HR:449) (SU)
Foster employee engagement and commitment (HR:513) (SU)
Coach employees (HR:364) (SU)
Recognize/Reward employees (HR:365) (SU)

All standards are pulled from Standards | Business Education Guidelines | MBA Research

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- TCC1 (9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.
- CCE1 (9-12): I can initiate discussions, respect differing viewpoints, and respond thoughtfully.
- TI1 (9-12): I can implement a realistic plan and adapt to achieve my goals.

Understandings: Students will understand that... ● Effective communication, math, and technology skills are essential in marketing. ● Marketing professionals must collaborate and adapt to dynamic business environments. ● Strong management and interpersonal skills enhance team productivity.	**Essential Questions:** 1. Why are communication skills critical in marketing? 2. How do math and technology support marketing strategies? 3. What role do interpersonal and management skills play in a marketing career?
Students will know... ● Principles of business communication. ● Basic marketing-related math skills. ● Use of technology in marketing.	**Students will be able to...** ● Develop professional emails, reports, and presentations. ● Analyze data to support marketing decisions. ● Utilize digital tools to enhance marketing efforts.
Key Vocabulary: Communication strategies, analytics, CRM software, digital marketing tools, leadership.	
Assessment Evidence	
Performance Tasks: Great Business Leaders of All Time: Students develop a presentation highlighting someone that they believe to be a great leader in the business world. Beyond the basic biographical information, students are also required to rationalize their thinking by applying what they have learned throughout this unit. Captain Sully: After watching clips from the movie “Sully” students work with each other to explain the foundations of leadership and how they are apparent in the film. These are shared orally and on a document uploaded in google classroom. **Additional Performance Tasks:** Sales Tax Worksheet Communication Quiz	**Other Evidence:** Business Consultation Summative

Communication Role Play Best Communicators of All Time Tech Workshop Technology Quiz School Store Expansion I	

Learning Plan

- Role-playing business communication scenarios (**CCE1**).
- Marketing math workshop (**TCC1**).
- Using technology for data analysis (**TI1**).

Teacher Resources:

Marketing Essentials Textbook, CNBC Original Videos, YouTube, Amazon streaming

Unit 2 - Distribution

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Supply Chain Management
Understand supply chain management role to recognize its need in business.
Explain the concept of supply chain (OP:443) (CS)
Explain the benefits of supply chain collaboration (OP:444) (SP)

All standards are pulled from Standards | Business Education Guidelines | MBA Research

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC3 (9-12): I can integrate relevant information to produce multiple valid solutions.
- AA2 (9-12): I can assess my past successes and mistakes to change my approach.
- CCE3 (9-12): I can show initiative in prompting group discourse and fostering collaboration.

Understandings: Students will understand that...

- Distribution affects product availability and customer satisfaction.
- Efficient supply chain management reduces costs and increases efficiency.
- Logistics play a critical role in getting products to market.

Essential Questions:

1. How does distribution impact customer experience?
2. What are the key components of an efficient supply chain?
3. How do businesses choose the best transportation methods?

Students will know…

- Distribution channels and logistics.
- Supply chain management principles.

Students will be able to...

- Analyze supply chain case studies.
- Compare and contrast distribution strategies.

• Role of intermediaries in marketing.	• Develop a distribution plan for a product.
Key Vocabulary: Logistics, supply chain, wholesalers, retailers, intermediaries.	
Assessment Evidence	
Performance Tasks: School Store Buying Assignment: Students play the role of procurement manager for the school store. In this role they pick and shop for items that should be stocked in the store in the upcoming selling season. They need to make decisions regarding quantities, unit pricing, promotions, shipping, taxes etc 6 month merchandise plan: Students use excel/sheets to create a template for a 6 month merchandise for the school store. Once the template is created, students are provided with sales data to use a inputs to correctly forecast inventory needs for the next 6 months **Additional Performance Tasks:** Agents Vertical vs Horizontal Starbucks CM: From Bean to Cup Physical Distribution Quiz	**Other Evidence:** School Store Channel Management Manual
Learning Plan	
• Supply chain simulation game (**TCC3**). • Analyzing real-world distribution strategies (**AA2**). • Group project on logistics planning (**CCE3**).	
Teacher Resources: Marketing Essentials Textbook, CNBC Original Videos, YouTube, Amazon streaming, Online case studies and simulations, Industry guest speakers.	

Unit 3 - DECA Competitive Events

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Understand DECA competitive event categories and expectations.
Apply marketing principles to competition scenarios.
Develop presentation and problem-solving skills.

DECA's programs, especially its Competitive Events Program, are intentionally designed to reinforce and measure a student's mastery of the National Curriculum Standards in its four key career clusters:

- Marketing
- Finance
- Hospitality and Tourism
- Business Management and Administration
- Business Administration Core

Competitive Events

- DECA's competitive events, which include written exams, role-plays, case studies, and prepared projects, are industry-validated and based on these National Curriculum Standards.
- This ensures that the content being tested and applied by students reflects the real-world performance indicators and skills required by business and industry.

*Specific standard will be dependent upon which event students elect

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

- TI4 (9-12): I can apply my strengths and anticipate challenges to reach my current and future goals.
- P3 (9-12): I can accept constructive feedback and use setbacks to adjust my learning journey.
- P4(9-12): I can take-on challenges and continuously engage in my own long-term strategies to overcome them to demonstrate through personal experience that failures are more instructive than discouraging.

- CCE2 (9-12): I can give and receive actionable feedback for meaningful revisions.

Understandings: Students will understand that...	**Essential Questions:**
• DECA competitions develop real-world marketing and leadership skills. • Preparation and practice improve performance. • Feedback and reflection enhance professional growth.	1. What are DECA competitive events, and how do they apply to real-world marketing? 2. How does preparation impact competitive success? 3. Why is feedback important in improving performance?
Students will know…	**Students will be able to...**
• DECA event categories and judging criteria. • Strategies for effective presentations. • The role of problem-solving in competitions.	• Prepare for and participate in DECA events. • Deliver persuasive and professional presentations. • Apply marketing knowledge to competition scenarios.

Key Vocabulary: DECA, competition rubric, case study analysis, role-play scenarios, presentation skills.

Assessment Evidence

Performance Tasks:	**Other Evidence:**
DECA Manual: Students use the national DECA guidelines to create a manual of their choice in one of the following areas: -Marketing Research -Promotional Plan -Business Plan -Communitry service campaign Students will have the option of presenting their manual to a panel of judges at the DECA State Career Development Conference in semester 2 of each academic year. **Additional Performance Tasks:** Participate in a mock DECA competition. DECA Manual Rough Draft	DECA Presentation DECA Conference Participation and judges evaluation Midterm Exam/Project

DECA manual progress	

Learning Plan
• Role-play competition scenarios (**CCE2**). • Case study analysis and strategy development (**TI4**). • Presentation practice and peer feedback sessions (**P3**).
Teacher Resources: DECA Plus, DECA.org, DECA state events and advisor list, DECA competition guidelines, Sample case studies and role-play prompts, Public speaking and presentation resources.

Unit 4 - Pricing

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Understand pricing strategies and their impact on marketing.
Analyze consumer perception and competitive pricing.
Discuss pricing models based on market research.
Describe the functions of prices in markets (EC:006, LAP-EC-012) (CS)

All standards are pulled from Standards | Business Education Guidelines | MBA Research

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC2 (9-12): I can evaluate evidence from multiple perspectives to justify new conclusions.
- CCE4 (9-12): I can communicate my understanding in an authentic and relevant way.
- AA1 (9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...

- Pricing impacts consumer decision-making and profitability.
- Various pricing strategies exist for different business objectives.
- Competitive pricing requires research and analysis.

Essential Questions:

1. How do pricing strategies influence consumer behavior?
2. What factors determine the best pricing approach?
3. How do businesses balance profitability and competitiveness?

Students will know...

- Pricing models and strategies.
- Psychological factors affecting pricing.
- Competitor pricing analysis techniques

Students will be able to...

- Develop a pricing strategy for a product.
- Conduct competitor pricing analysis.
- Adjust pricing based on market data

Key Vocabulary: Price elasticity, penetration pricing, psychological pricing, competitive analysis, profit margin.

Assessment Evidence

Performance Tasks:	**Other Evidence:**
Pricing Strategies: Students work in groups to define a collection of different pricing strategies that are used by businesses. They must then provide examples of each in the real world and pick at least two to explain to the rest of the class **Additional Performance Tasks:** Pricing Math Quiz Legal and Ethical Pricing Pricing Quiz	Pricing Case Study and Presentation

Learning Plan

- Case study on pricing decisions (**TCC2**).
- Competitor pricing research project (**AA1**).
- Presentation of pricing strategies (**CCE4**).

Teacher Resources: Marketing Essentials Textbook, CNBC Original Videos, YouTube, Amazon streaming, Online case studies and simulations, Industry guest speakers, Freakonomics Podcast

Unit 5 - Marketing Information Management

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Understands tools, strategies, and systems needed to access, process, maintain, evaluate, and disseminate information to assist business decision-making
Assess information needs (NF:077) (CS)
Obtain needed information efficiently (NF:078) (CS)
Evaluate quality and source of information (NF:079) (CS)
Draw conclusions based on information analysis (NF:278) (CS)
Apply information to accomplish a task (NF:080) (CS)
Explain the role of ethics in information management (NF:111) (SP)
Explain legal issues associated with information management (NF:076) (MN)
Determine venture's information technology needs (NF:012) (MN)
Conduct an environmental scan to obtain business information (NF:015, LAP-NF-015) (SP)
Interpret statistical findings (NF:093) (SP)
Translate research findings into actionable business recommendations (NF:216) (SP)
Explain the principles of data analysis (NF:139) (SP)
Explain the nature of tools that can be used to access information in the database system (NF:140) (SP)

All standards are pulled from Standards | Business Education Guidelines | MBA Research

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- TCC3 (9-12): I can integrate relevant information to produce multiple valid solutions.
- TI2 (9-12): I can evaluate my objectives and a variety of credible resources to find the best solutions.
- P4 (9-12): I can take on challenges and engage in long-term strategies to overcome them.

Understandings: Students will understand that...

- Marketing data is essential for making informed business decisions.
- Various research methods provide different insights into consumer behavior.

Essential Questions:

1. How do businesses collect and analyze marketing data?
2. What are the different types of market research?
3. How does data interpretation impact marketing decisions?

• Businesses must analyze and apply data effectively to stay competitive.	
Students will know… • Data collection methods and research techniques. • How to interpret and apply marketing analytics. • The ethical considerations in data usage.	**Students will be able to...** • Conduct marketing research using primary and secondary data. • Analyze and interpret data to make marketing recommendations. • Utilize data visualization tools to communicate insights.
Key Vocabulary: Market research, data analysis, consumer insights, qualitative vs. quantitative research, data visualization.	
Assessment Evidence	
Performance Tasks: MIM Role Play: Students are paired up and take on different roles within a business. Each student is then provided a scenario that relates to DECA's competitive event series in the marketing information management category. The scenario requires students to prepare a response and hit certain performance indicators in an allotted amount of time. **Additional Performance Tasks:** MIM Guiding Questions MIM Interim Quiz	**Other Evidence:** MIM presentation with data
Learning Plan	
• Conducting consumer surveys and analyzing results (**TCC3**). • Case study on how businesses use data (**TI2**). • Presenting marketing research findings using data visualization (**P4**)	
Teacher Resources: Marketing Essentials Textbook, CNBC Original Videos, YouTube, Amazon streaming, Online case studies and simulations, Industry guest speakers, Freakonomics Podcast	

Unit 6 - Product/Service Management

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Implement purchasing activities to obtain business supplies, equipment, resources, and services.
Explain the nature and scope of purchasing (OP:015, LAP-OP-015) (CS)
Place orders/reorders (OP:016) (CS)
Maintain inventory of supplies (OP:031) (CS)
Discuss the importance of utilizing ethical purchasing methods (OP:246) (SP)
Explain the impact of the purchasing process on productivity (OP:247) (SP)
Manage the bid process in purchasing (OP:160) (SP)
Select vendors (OP:161) (SP)
Evaluate vendor performance (OP:162) (SP)
Establish bid specifications (OP:243) (MN

All standards are pulled from Standards | Business Education Guidelines | MBA Research

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- AA3 (9-12): I can adjust my expectations and behaviors to succeed in a changing environment.
- TCC4 (9-12): I can integrate my learning to adapt to experiences in the classroom, career, and life.
- TI3 (9-12): I can formulate and investigate probing questions to further my learning.

Understandings: Students will understand that…

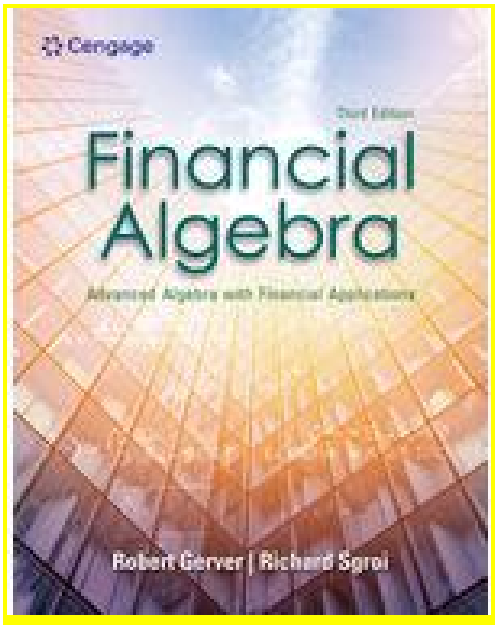
- Products and services evolve to meet changing consumer needs.
- Businesses must continuously manage and improve their offerings.
- The product life cycle affects marketing and business strategies.

Essential Questions:

1. How do businesses develop and improve products and services?
2. What role does the product life cycle play in marketing strategies?
3. How do businesses ensure product relevance in a competitive market?

Students will know...	**Students will be able to...**
• Product life cycle stages. • Strategies for product development and improvement. • The role of consumer feedback in product management.	• Analyze product life cycles and recommend improvements. • Develop a proposal for a new product or service. • Evaluate strategies for maintaining product competitiveness.
Key Vocabulary: Product life cycle, innovation, market testing, product differentiation, customer feedback.	
Assessment Evidence	
Performance Tasks: Product positioning map: Students create a poster that illustrates product positioning in an industry of their choice or assigned. The map must include pictures and an explanation/rationale about where certain products/brands were placed on the map. **Additional Performance Tasks:** Product Life Cycle Product mix Build a brand	**Other Evidence:** Burger Rebrand Final Exam
Learning Plan	
• Analyzing product life cycles of real-world brands (**TCC4**). • Group project on designing and marketing a new product (**TI3**). • Evaluating product improvement strategies through case studies (**AA3**).	
Teacher Resources: Marketing Essentials Textbook, CNBC Original Videos, YouTube, Amazon streaming, Online case studies and simulations, Industry guest speakers, Freakonomics Podcast	

Algebra 2 with Financial Applications CURRICULUM



Grade Level(s): 10-11

Curriculum Author(s): Raymond Robillard

Course Description: Students in this full-year Algebra 2 with Financial Applications course will further their study of Algebra through real-world financial applications. The course covers many Algebra 2 topics from the perspective of financial applications under eight umbrellas: discretionary expenses, banking, investing, credit, employment and income taxes, automobile ownership, independent living, and retirement planning & household budgeting. Students will experience the interrelatedness of mathematical topics, find patterns, make conjectures, and extrapolate from known situations to unknown situations. The mathematical topics contained in this course are introduced, developed, and applied in an as-needed format within the financial settings covered. Students are encouraged to use a variety of problem-solving skills and strategies in real-world contexts, and to question outcomes using mathematical analysis and data to support their findings. This course offers students multiple opportunities to use, construct, question, model, and interpret financial situations through symbolic, algebraic, graphical, geometric, and verbal representations. This course is an alternative to taking Algebra 2.
Credit type: STEM, 1 credit (Fulfills the State of Connecticut Financial Literacy Requirement)

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Discretionary Expenses	What is an essential expense?	Statistics can be used to examine the types of expenses we may have now and in the future.	TCC4(9-12); CCE1(9-12); AA1(9-12)
Banking Services	How does banking help us plan for the future?	Banks have a variety of different account options available, each with unique advantages and disadvantages.	TCC3(9-12); TI3(9-12); AA4(9-12)
Consumer Credit	How do you maintain and monitor credit and loans?	Credit provides you with a way to increase your standard of living, as long as your purchases are made with careful financial planning.	TI3(9-12); AA2(9-12)
Automobile Ownership	What data is important to the driver of a car?	Before embarking on the purchase of an automobile, students need to be aware of the finances involved with operating a car.	TI2(9-12); AA4(9-12)
Employment Basics	In what ways can you be compensated for work that you do at a job?	It is important to learn and understand as much as possible about the job you hold: the salary you make, the benefits offered, and the taxes you pay.	TCC2(9-12); AA4(9-12)
Income Taxes	How do we determine who pays taxes and how much they pay?	The money collected through taxes helps our government fund police forces, fire departments, political officers, teachers, research, military defense, public assistance programs, and much more.	TI3(9-12); TCC4(9-12)
Independent Living	What factors come into play when buying or renting a home?	There are many factors that influence how and where you live and students will want to make wise, well-thought-out decisions,	TCC1(9-12); AA1(9-12)
The Stock Market	What are stocks?	With a strong knowledge of the stock market, cooperations, and investment	TCC4(9-12); AA4(9-12)

		strategies, you as an investor can make decisions that are based on experience, data, trends, and mathematics.	
Mathematically Modeling a Business Start-Up	What do I need to know to start my own business?	Creating a business model allows a person to use variables and examine relationships among those variables to make predictions that will help maximize profit.	TCC4(9-12); CCE4(9-12)
Planning for Retirement	Why and how should you save for retirement?	It is important to become knowledgeable about the pros and cons of each type of retirement plan so you are ready when you retire.	CCE3(9-12); TI4(9-12)
Preparing a Budget	How do you organize all your expenses so you can spend accordingly?	Budgeting provides a clear picture of how much you are spending and what you are spending it on.	TCC4(9-12); AA1(9-12)

Unit 1 - Discretionary Expenses

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying discretionary and essential expenses are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- S-ID1-Represent data with plots on the real number line (dot plots, histograms, and box plots).
- S-ID2-Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit.
- S-ID9-Distinguish between correlation and causation.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with

labels and scales.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
CCE1(9-12): I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...

- Statistics can be used to examine the types of expenses we may have now and in the future.
- Keeping a mathematical eye on your spending will help you become an informed and skilled consumer.

Essential Questions:

- What is an essential expense?
- What can graphs tell us about our finances?
- How can past trends predict future occurrences?

Students will know…

- The differences between essential and discretionary expenses
- The differences between wholesale and retail prices
- The different types of warranties available to them
- How percentile rank can be used to interpret data
- The difference between measures of central tendency and measures of dispersion
- How the different measures of dispersion differ from each other
- How linear regression analysis can assist in interpreting financial data

Students will be able to…

- Calculate percent markup and percent discount
- Create and interpret a frequency distribution table
- Use sigma notation or a frequency distribution table to determine the mean, median,and mode of a data set
- Calculate the expiration date of a warranty
- Define, determine, and interpret cumulative, relative, and relative cumulative frequencies
- Model a situation using a spreadsheet
- Define, determine, and interpret percentiles
- Compute the range, mean deviation, variance, and standard deviation of a data set
- Measure dispersion using standard deviation units
- Compute z-scores
- Find percentages using the normal curve
- Compute raw scores using z-scores
- Graph bivariate data to construct a scatterplot
- Interpret patterns and trends based on data
- Fit a linear regression equation to a scatter plot
- Find an interpret the correlation coefficient
- Make predictions based on lines of best fit

Key Vocabulary:
gross income, disposable income, essential expense, discretionary expense, wholesale prices, retail prices, markup, statistics, data, measures of

central tendency, mean, median, mode, subscript, index, outlier, skewed data set, bimodal, frequency distribution, planned obsolescence, warranty, implied warranty, express warranty, full warranty, limited warranty, extended warranty, caveat emptor, warranty expiration date, cumulative frequency, relative frequency, relative cumulative frequency, spreadsheet, cell, percentile, percentile rank, dispersion, range, mean deviation, mean absolute deviation, variance, standard deviation, raw data, standard score, z-score, normal curve, normal distribution, bell curve, asymptotic, tails, univariate data, bivariate data, scatterplot, trend, correlation, causal relationship, explanatory variable, response variable, lurking variable, linear regression analysis, linear regression equation, independent variable, dependent variable, domain, interpolation, extrapolation, correlation coefficient

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about discretionary spending and how statistics can be used to interpret and analyze expenses and trends. As students begin, they learn how the measures of central tendency can be used to better understand expense data, and how to organize that data efficiently in a variety of ways. They will then investigate how measures of dispersion can help analyze data using entertainment expenses. One measure of dispersion, the standard deviation, is used to create standard scores, and compare them to raw scores and percentages. Finally, personal expenses in the forms of paired data are charted and analyzed using scatter plots and linear regression analyses. The purpose of this unit is to show how statistics can be used to make sense of finance-related discretionary expense data.

This unit is broken down into the following sections:
1.1 - Discretionary and Essential Expenses
1.2 - Travel Expenses
1.3 - Entertainment Expenses
1.4 - Vacation Expenses
1.5 - Personal Expenses

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
CCE1(9-12): I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students are asked to reflect on the differences that they observed between discretionary expenses and mandatory expenses. A graphic is provided that shows the way different age groups spend their time(as opposed to their money). Students are asked to write a new article that describes and interprets the data and infographic. They should use terminology and statistical processes from the unit.
Really? Really! Revisited: Students will utilize data on the number of internet connected devices used over the last 6 years and predictions of the number of devices used over the next 5 years. By conducting a statistical analysis, students will answer many questions and make predictions about this data as well as reflect on the ramifications for society moving forward.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 2 - Banking Services

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying banking are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
- A-SSE1a-Interpret parts of an expression, such as terms, factors, and coefficients.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.
- F-BF1a-Determine an explicit expression, a recursive process, or steps for calculation from a context.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-BF5-Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
- N-RN1-Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.*
- N-RN2-Rewrite expressions involving radicals and rational exponents using the properties of exponents.

<table>
<tr><td colspan="2">Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
TCC3(9-12): I can integrate relevant information to produce multiple valid solutions.
TI3(9-12): I can formulate and investigate probing questions to further my learning.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.</td></tr>
<tr><td>Understandings: Students will understand that...
Banks offer customers ways to safely keep and track their money.
Banks have a variety of different account options available, each with unique advantages and disadvantages.
Long term planning, including a schedule for making withdrawals or deposits, is critical to meeting financial goals.</td><td>Essential Questions:
What options do banks offer for consumers?
What is interest and how is it computed?
How does banking help us plan for the future?</td></tr>
<tr><td>Students will know...
How checking account deposits, withdrawals, and electronic funds transfers are made and recorded
The differences between and among types of checking accounts
The basic vocabulary of savings accounts
How the components of an arithmetic sequence work
How interest and inflation affect purchasing power
Interest is accrued on interest
How the compound interest formula is derived
The differences between the terms finite and infinite</td><td>Students will be able to...
Keep accurate financial records
Protect themselves from identity fraud
Use a check register
Reconcile a checking account with a bank statement by hand and by using a spreadsheet
Compute simple interest using the simple interest formula
Compute compound interest using a table
Make computations using the compound interest formula
Compute interest on an account that is compounded continuously
Calculate the future value of a periodic deposit investment
Graph the future value function
Calculate the present value of a single deposit investment
Calculate the present value of a periodic deposit investment
Determine the maturity (term) of an investment
Construct exponential and logarithmic models of a situation
Evaluate logarithms
Express exponential models as logarithms
Use the change-of-base formula
Evaluate common and natural logarithms
Apply the One-to-One Property and Power Property
Determine the term of systematic savings and withdrawals
Interpret the graph of a future value function</td></tr>
</table>

Key Vocabulary:
checking account, check, electronic funds transfer(EFT), payee, drawer, check clearing, automated teller machine(ATM), personal identification number(PIN), debit card, ATM card, deposit slip, direct deposit, hold, endorse, canceled, insufficient funds, overdraft protection, maintenance fee, interest, traditional checking account, interest-bearing checking account, free checking account, online checking account, lifeline checking account, student e-checking account, single account, joint account, mobile payment apps, peer-to-peer(P2P), identity fraud, encryption, check register, debits, credits, account number, bank statement, statement period, starting balance, ending balance, outstanding deposits, outstanding withdrawals, balancing, reconciling, savings account, interest rate, principal, annual percentage rate(APR), simple interest, simple interest formula, statement savings, minimum balance, money market account, 529 Plan, high-yield interest accounts, certificate of deposit(CD), maturity, liquidity, time value of money, arithmetic sequence, common difference, finite arithmetic sequence, infinite arithmetic sequence, inflation, market basket, purchasing power of money, compound interest, annual compounding, semiannual compounding, quarterly compounding, monthly compounding, daily compounding, crediting, compound interest formula, annual percentage yield(APY), CD penalty for early withdrawal, limits, continuous compounding, function, rational function, exponential base(e), future value of an investment, future value of a single deposit investment, periodic investment, biweekly, future value of a periodic deposit investment, rule of 72, present value, present value of a single deposit investment, present value of a periodic deposit investment, maturity, term, logarithmic equation, logarithm(log), common logarithm, antilogarithm, change-of-base formula, natural logarithm, systematic savings account, One-to-One Property, Power Property, systematic withdrawal account

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan
This unit is all about checks, debit cards, and what happens to money and its value over different time periods. It is important for students to know how to keep accurate financial records. Reconciling a bank statement is demonstrated in this unit. Students learn about the importance of protecting themselves from errors and threats like identity theft. Students also learn about savings accounts, simple interest, and several types of compounding interest. By using the future value formulas, students see how much a single or periodic deposit would grow over a period of time. The main purpose of this unit is for students to be smart avers through their entire lifetime. This unit is broken down into the following sections: 2.1 - Checking Accounts 2.2 - Reconciling a Bank Statement 2.3 - Savings Accounts 2.4 - Exploring Compound Interest 2.5 - Compound Interest Formula 2.6 - Continuous Compounding 2.7 - Future Value of Investments 2.8 - Present Value of Investments 2.8 - Present Value of Investments 2.9 - The Term of a Single Deposit Amount 2.10 - The Term of a Systematic Account The following vision of a learner attributes are assessed through the following summative activities: TCC3(9-12): I can integrate relevant information to produce multiple valid solutions. TI3(9-12): I can formulate and investigate probing questions to further my learning. AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation. **You write the story**: Students will analyze a double box plot regarding the average savings by age, comparing mean and median bank account balances. With this info they will write a news-style article that identifies and interprets key conclusions about the data. They should use terminology and mathematical processes from the unit in their paper. **Really? Really! Revisited**: Students will explore the site fred.stlouisfed.org which houses some of the most comprehensive research on the state of savings by Americans since 1991. From there, they will determine what percentage of income is saved versus used as disposable income. Additionally, they will look at factors that are connected to saving quantities, and seek a correlation that can be used to make predictive conclusions.
Teacher Resources: ● Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026) ● Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 3 - Consumer Credit

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying credit are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
- A-SSE2-Use the structure of an expression to identify ways to rewrite it. For example, see x4 - y4 as (x2)2 - (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 - y2)(x2 + y2).
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- A-SSE3c-Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- F-BF1a-Determine an explicit expression, a recursive process, or steps for calculation from a context.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.
- F-LE5-Interpret the parameters in a linear or exponential function in terms of a context.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- S-ID6a-Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TI3(9-12): I can formulate and investigate probing questions to further my learning.
AA2(9-12): I can assess my past successes and mistakes to change my approach.

Understandings: Students will understand that...

- Credit is a promise to pay in the future for goods and/or services you purchase or use today.
- Credit has both advantages and disadvantages.
- Credit provides you with a way to increase your standard of living, as long as your purchases are made with careful financial planning.

Essential Questions:

- What information is valuable to know before using credit or taking out a loan?
- How do you maintain and monitor credit and loans?

Students will know...

- Definitions of basic credit terms
- The different types of lending institutions
- The available options for student loans
- The basic vocabulary of credit cards
- The components of the minimum payment box and how the information there assists the consumer
- The definition of negative amortization and why the government outlawed its usage by creditors

Students will be able to...

- Computer finance charges for installment purchases
- Compute monthly payments for given loans using a table and using a formula
- Compute interest on loans
- Calculate the interest due in various student loan situations
- Apply the simplified daily interest formula
- Calculate the interest rate, monthly payment, and term for a consolidated loan
- Use the logarithmic loan length formula to determine the term of a loan
- Use regression to find the curve of best fit using data from a loan table
- Compute an average daily balance
- Verify the accuracy of a credit card statement
- Calculate the average daily balance and finance charge using the credit calendar
- Determine if loan consolidation makes sense in a particular situation

Key Vocabulary:
credit, debtor, creditor, earning power, credit rating, credit score, credit reporting agency, FICO score, installment plan, down payment, finance charge, deferred payment plan, layaway plan, flexible payment plan, default, promissory note, principal, cosigner, life insurance, prepayment privilege, prepayment penalty, wage assignment, wage garnishment, balloon payment, lending institution, savings bank, commercial bank, credit union, consumer finance company, pawnshop, collateral, secured loans, unsecured loans, payday loan store, payday loan, career school, scholarships, qualified educational costs, Free Application for Federal Student Aid(FAFSA), Student Aid Report(SAR), expected family

contribution(EFC), federal loan, private loan, Federal Direct Subsidized Loan, defer, Federal Direct Unsubsidized Loan, accrues, Federal Direct PLUS Loan, Federal Direct Consolidation Loan, origination fee, standard repayment plan, graduated repayment plan, income-based repayment(IBR) plan, return on investment(ROI), major, interest capitalization, simplified daily interest formula, gross income, refinance, consolidation, weighted average, weight factor, monthly payment calculator, loan length formula, cubic function, cubic regression equation, credit card, impulse buying, revolving charge account, charge card, identity theft, fraud protection, Truth-in-Lending Act, Schumer Box, Fair Credit Billing Act, Fair Debt Collection Practices Act, average daily balance, billing cycle, credit card statement, account number, credit line, credit limit, available credit, billing data, payment due date, transactions, debt/credit, previous balance, payments/credits, new purchases, late charge, finance charge, new balance, minimum payment, available daily balance, number of days in billing cycle, monthly periodic rate, credit calendar, billing date, minimum payment warning box, negative amortization(NegAm)

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about the idea of “buy now and pay later”, or more formally, credit. Students scrutinize the variety of types of loans and corresponding payment plans from different lending institutions. Included in this is a discussion of a very relevant loan: the student loan. Advantages of using credit cards and the laws governing their use is a focus of the later part of the unit, as is reading and understanding credit statements. Students will calculate the average daily balance and finance charge of a statement to verify its accuracy. The main purpose of this unit is for students to manage credit effectively.

This unit is broken down into the following sections:
3.1 - Introduction to Consumer Credit
3.2 - Loans
3.3 - Student Loans
3.4 - Loan Calculations and Regression
3.5 - Credit Cards
3.6 - Credit Card Statement
3.7 - Average Daily Balance

The following vision of a learner attributes are assessed through the following summative activities:
TI3(9-12): I can formulate and investigate probing questions to further my learning.
AA2(9-12): I can assess my past successes and mistakes to change my approach.

You write the story: Students will write a paper about the average amount of debt carried by US residents by state. An infographic will be provided and students should summarize the information by considering average values, the degree of variance, and potential explanatory variables for the amount of debt per state. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will expand on their mathematical learning of exponential growth, geometry, and ratio/proportion as they answer questions relating to the estimated 1.5 billion credit cards in use today. This culminating activity eschews the financial content of this lesson in favor of more math-heavy questioning as a form of spiral review for students.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 4 - Automobile Ownership

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and key assignments in this Automobile Ownership Unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
- A-REI2-Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- A-REI11-Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF3-Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the

Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.

- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF6-Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-IF7e-Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.
- F-IF9-Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-BF5-Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
- F-LE1b-Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- F-LE1c-Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
- F-LE2-Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- F-LE4-For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
- F-LE5-Interpret the parameters in a linear or exponential function in terms of a context.
- G-C5-Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
- S-ID1-Represent data with plots on the real number line (dot plots, histograms, and box plots).
- S-ID2-Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- S-ID3-Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-CP1-Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
- S-CP2-Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
- S-CP3-Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
- S-CP4-Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*
- S-MD1-Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
- S-MD2-Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
- S-MD4-Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
TI2(9-12): I can evaluate my objectives and a variety of credible resources to find the best solutions for any challenge.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that...
- Owning an automobile is a tremendous responsibility.
- Before embarking on the purchase of an automobile, students need to be aware of the finances involved with operating a car.
- Automobile knowledge will result in a safer, less expensive, and more enjoyable experience.

Essential Questions:
- What is involved in the purchase of an automobile?
- How does automobile insurance work?
- How does the value of a car change over time?
- What data is important to the driver of a car?

Students will know...
- When to use a box-and-whisker plot or a stem-and-leaf plot for a given situation
- The differences between types of auto insurance coverage
- The definition of depreciation and how it relates to automobile value
- How to write, interpret, and graph a straight-line depreciation

Students will be able to...
- Compute the cost of classified ads for used cards
- Compute the cost of sales tax on automobiles
- Compute quartiles and interquartile range
- Create a frequency distribution from a set of data
- Compute insurance costs and payments on insurance claims
- Compute conditional probabilities based on two-way tables

equation • The definition of perception-reaction time as it relates to driving • The definition of breaking distance and time as it relates to driving	• Determine if two events are independent • Read and interpret two-way tables and Venn diagrams • Create Venn diagrams • Create expense functions • Manipulate the exponential depreciation equation in order to determine time, original price, and depreciated value • Write, interpret, and graph an exponential depreciation equation • Write, interpret, and use the distance formula • Use the formula for the relationship between distance, fuel economy, and gas usage • Calculate and compare MPG and MPGe • Compare costs for buying, leasing, and renting a car • Compare gas prices around the world using different international currencies • Calculate perception-reaction time and distance in the English Standard System • Calculate breaking distance in the English Standard System and metric system • Calculate total stopping distance in the English Standard System and metric system • Determine the minimum skid speed using the skid mark formula and the yaw mark formula

Key Vocabulary:
sales tax, domain, piecewise function, split function, cusp, impression, click, data, measures of central tendency, quartiles, lower quartile, upper quartile, subscript, interquartile range(IQR), stem-and-leaf plot, box-and-whisker plot, box plot, modified box-and-whisker plot, lease, lessee, lessor, liable, negligent, automobile insurance, premium, claim, liability insurance, bodily injury liability(BI)m property damage liability(PD), uninsured/underinsured motorist protection(UMP), personal injury protection(PIP), no-fault insurance, comprehensive insurance, collision insurance, car-rental insurance, emergency road service insurance, driver education course, defensive driving course, surcharge, deductible, actuary, probability, event, two-way table, conditional probability, independent events, associated events, Venn diagrams, equiprobable, depreciate, appreciate, straight-line depreciation, linear depreciation, slope, straight-line depreciation equation, expense functions, fixed expense, variable expense, dollar value, historical data, historical depreciation, exponential decay, exponential depreciation, exponential regression, geometric sequence, geometric progression, common ratio, odometer, trip odometer, speedometer, fuel economy measurement, miles per gallons(MPG), miles per gallon equivalent(MPGe), kilowatt hours per 100 miles(kWh/100), kilowatt hour(kWh), kilometers per liter(km/L), English Standard System, metric system, distance formula, currency exchange rate, perception time, reaction time, breaking time, breaking distance, perception-reaction time, perception-reaction distance, total stopping distance, accident reconstructionist, skid mark, shadow skid mark, antilock braking system(ABS), yaw mark, skid speed formula, drag factor, braking efficiency, skid distance, chord, middle ordinate, projectile motion,

trajectory

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about examining the many different facets of becoming an informed, responsible driver, from purchasing a car to insuring it and covering needed repairs. Students discuss the costs associated with buying and registering a car, as well as how that investment depreciates in value over time. Types of insurance are compared and contrasted as well as a comparison between buying and leasing. Knowledge of reaction time and safe driving are important both from their mathematical relevance, but also for the safety of all. The main purpose of this unit is to make the time spent behind the wheel of an automobile safer and more enjoyable.

This unit is broken down into the following sections:
4.1 - Automobile Ads
4.2 - Automobile Transactions
4.3 - Automobile Insurance
4.4 - Probability: The Basis of Insurance
4.5 - Linear Automobile Depreciation

4.6 - Historical and Exponential Depreciation
4.7 - Driving Data
4.8 - Driving Safety Data
4.9 - Accident Investigation Data

The following vision of a learner attributes are assessed through the following summative activities:

TI2(9-12): I can evaluate my objectives and a variety of credible resources to find the best solutions for any challenge.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will write a paper about the growth of electric vehicles. Data is provided in the form of a cumulative frequency distribution extrapolated for the years 2026 to 2040. Students will debate whether the growth of this type of vehicle is positive from the perspectives of cost, safety, reliability, and effect on the environment. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the connection between gas prices and inflation. A key question will be, "have gas prices changed consistently with inflation? And, if not, what factors can be connected to deviations from an exponential pattern of inflation since the year 1950. Students will need to use a regression model using data provided. Finally, a conclusion should be made about what gas prices will look like x years from now.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 5 - Employment Basics

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying employment are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
TCC2(9-12): I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that... ● It is important to learn and understand as much as possible about the job you hold: the salary you make, the benefits offered, and the taxes you pay. ● You need to be well prepared to enter the workforce.	**Essential Questions:** ● In what ways can you be compensated for work that you do at a job? ● What types of deductions are taken from your paycheck?
Students will know... ● The meanings of abbreviations in classified ads ● The advantages and disadvantages of pay based on production ● The value and importance of various employee benefits	**Students will be able to...** ● Computer periodic salary based on annual contract salary ● Express classified ad prices as piecewise functions ● Compute weekly, semimonthly, and biweekly earnings given annual salary ● Compute hourly pay and overtime pay given hourly rate ● Compute annual salaries based on annual percentage increases ● Compute pay based on percent commission ● Compute piecework pay ● Compute paycheck deductions for Social Security and Medicare
Key Vocabulary: employment agency, recruitment agency, employer paid, fee paid, applicant paid, resume, Form W-4: Employee's Withholding Allowance Certificate, benefits, self-employed, discount, direct deposit, paycheck advance, pay yourself first, hourly rate, regular hours, overtime hours, overtime hourly rate, time-and-a-half overtime, double-time pay, gross pay, minimum wage, commission, royalty, pieceworkers, piecework rate, insurance, paid vacation time, paid time off(PTO), stock ownership plans, childcare leave, contribution matching, family healthcare, individual healthcare, deductible, copayment, copay, pension, unemployment insurance, base period, worker's compensation, Social Security, Federal Insurance Contributions Act(FICA), FICA taxes, Social Security tax, Medicare tax, maximum taxable income, Social Security number, cusp	
Assessment Evidence	
Performance Tasks: A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include: ● Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. ● "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills. ● "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given	**Other Evidence:** ● Warmup problems provided in each lesson ● Checks for understanding provided in each lesson ● Book application problems

numbers. • "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature. An example of these types of activities can be seen here: Assessment Example.pdf	

Learning Plan

This unit is an orientation into the employment world. First, students examine how to find a job. Next, students learn about the variety of ways they are compensated for this work, as well as the types of benefits they can expect to receive as part of their job. The flip-side to that is the various taxes and deductions that are taken from one's paycheck, also valuable information. The main purpose of this unit is that students master the knowledge of employee basics to ensure they can manage their adult finances wisely.

This unit is broken down into the following sections:
5.1 - Looking for Employment
5.2 - Pay Periods and Hourly Rates
5.3 - Commissions, Royalties, and Piecework Pay
5.4 - Employee Benefits
5.5 - Social Security and Medicare

The following vision of a learner attributes are assessed through the following summative activities:

TCC2(9-12): I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will write a paper about the national unemployment rate, by month, over the course of the last 10 years. They will be provided with a line graph with different colored lines for each year and the months of the year on the horizontal axis. They will make conclusions about why the unemployment rate peaked in April of 2014 as well as commenting on other trends. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the change in employment numbers for various careers (i.e.-Nurse Practitioners, Data Scientists, Software Developers, Physical Therapists, etc.). They will judge the reason why the information was presented in the way it was as well as extrapolating to other careers and to future employment numbers. Their conclusions should be backed up by research beyond the presented information from their textbook.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 6 - Income Taxes

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying employment and income taxes are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

- F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TI3(9-12): I can formulate and investigate probing questions to further my learning.
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

Understandings: Students will understand that...
- The money collected through taxes helps our government fund police forces, fire departments, political officers, teachers, research, military defense, public assistance programs, and much more.
- There are many different types of taxes, including sales tax, property tax, Social Security Taxes, and income taxes.
- It is important to keep up to date on changes to our tax code system.

Essential Questions:
- How do we determine who pays taxes and how much they pay?
- How do you compute your tax liability?

Students will know...
- Algebraic expressions of tax scales
- The various components and importance of a pay stub, W-2 form, and 1099 form
- The different types of income that can be reported using Form 1040 and Schedule 1
- The differences between a tax credit and a tax deduction

Students will be able to...
- Compute federal income taxes using a tax table and tax schedules
- Construct income tax graphs using compound equations(6.4)
- File a Form 1040 to compute tax liability
- File Form 1040 with Schedule 1
- File Form 1040 with Schedule A

Key Vocabulary:
property tax, sales tax, taxable income, income tax, Internal Revenue Service(IRS), single, married filing jointly, qualifying widow(er), married filing separately, head of household, constraint, inequality constraint, flat tax, proportional tax, progressive tax system, regressive tax schedule, marginal tax rate, effective tax rate, gross pay, net pay, take-home pay, paycheck, Form W-4, withholding tax, Form W-2, Form 1099, tax-deferred contribution, cafeteria plan, flexible spending account FSA, tax liability, voluntary compliance, tax return, Form 1040, Schedule 1 - Additional Income and Adjustments to Income, Schedule B - Interest and Dividend Income, standard deviation, dependent, Schedule C - Business Income, Schedule E - Supplemental Income, Publication 17: Your Federal Income Tax, tax avoidance, tax evasion, deductions, Schedule A - Itemized Deductions, tax credit, Publication 970: Tax Benefits for Education, itemized deductions, threshold

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the

Other Evidence:
- Warmup problems provided in each lesson

key concepts will be used to determine competency of the unit material. These include: ● Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. ● “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills. ● “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers. ● “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature. An example of these types of activities can be seen here: Assessment Example.pdf	● Checks for understanding provided in each lesson ● Book application problems

Learning Plan

This unit introduces students to the language, mechanics, and mathematics of income taxes. Students will learn how tax worksheets can simplify tax computations and they will actually learn how to fill in an actual tax return with relevant information. The main purpose of this unit is to give students enough familiarity with how taxes work that, as laws change over time, they will continue to understand the process well into adulthood.

This unit is broken down into the following sections:
6.1 - Tax Tables, Worksheets, and Schedules
6.2 - Modeling Tax Schedules
6.3 - Income Statements
6.4 - Form 1040 - Reporting Taxable Income
6.5 - Reducing Your Form 1040 Tax Liability

The following vision of a learner attributes are assessed through the following summative activities:

TI3(9-12): I can formulate and investigate probing questions to further my learning.
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

You write the story: Students will write a paper about the difference between individual income tax, payroll taxes, and corporate income tax amounts as a percentage of the Gross Domestic Product from 1972 extrapolated through 2032. They will rationalize those difference as fair and

appropriate or not. Further, they can comment on if the projections in the data are reasonable. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study Tax Freedom Dates since the year 2000. Is there a significance to these days when we consider day of the week, or what day (out of 365) they fall on each year). Students will study a regression between the year and day of the year to look for a pattern and answer a series of followup questions. Their conclusions should be backed up by research beyond the presented information from their textbook.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 7 - Independent Living

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying independent living are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-REI6-Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- A-APR6-Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions.
- F-TF7-Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.
- G-C5-Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
- G-MG3-Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).
- G-SRT5-Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- G-SRT8-Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
- G-GMD1-Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and

cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments*.
- S-ID6a-Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.
- S-ID6c-Fit a linear function for a scatter plot that suggests a linear association.
- S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...
- For many people, a home represents the largest financial undertaking of their lives.
- There are many factors that influence how and where you live and students will want to make wise, well-thought-out decisions,

Essential Questions:
- What factors come into play when buying or renting a home?
- How do mortgages work?
- How do you maintain a home?

Students will know...
- How square footage and monthly rent are related
- The signing costs of leases may vary
- What to research before buying a home
- Closing costs can be estimated prior to deciding whether or not to purchase a home
- The advantages and disadvantages of purchasing different types of homes

Students will be able to...
- Calculate the affordability of a monthly rent
- Calculate moving expenses
- Compute the perimeter and the area of a polygon
- Compute areas of irregular polygons
- Compute volumes of rectangular solids
- Compute the monthly cost of paying for a house
- Create an amortization table for fixed-rate mortgages
- Investigate the amortization table for an adjustable-rate mortgage
- Calculate discount points for a mortgage
- Determine the breakeven time for discount points
- Calculate negative points
- Compute the costs of purchasing a cooperative or condominium
- Find missing sides of right triangles using the Pythagorean theorem
- Use the converse of the Pythagorean theorem
- Find the slope of a line
- Create proportions for similar triangles
- Find missing sides and angles of right triangles using trigonometry

Key Vocabulary:
apartment, tenant, landlord, furnished, unfurnished, lease, expires, evict, single-family home, multiple-family home, condominium, cooperative, rent-burdened square footage, application deposit, security deposit, floor plan, scale, area, congruent, perimeter, apothem, Monte Carlo method, solid, volume, British Thermal Units(BTUs), promissory note, mortgage, market value, property tax, real estate tax, assessed value, down payment, escrow, fixed-rate mortgage, adjustable-rate mortgage, foreclose, private mortgage insurance(PMI), homeowner's insurance, front-end, ratio, back-end ratio, debt-to-income ratio, balloon mortgage, interest-only mortgage, recurring costs, nonrecurring costs, closing, closing costs, earnest money deposit, attorney fee, origination fee, title, title search, points, origination points, discount points, prepaid interest, arrears, transfer tax, amortization table, initial rate, hybrid ARMs, adjustment period, initial adjustment cap, periodic rate cap, lifetime cap, mortgage points, breakeven, negative points, condominium, board of directors, maintenance fee, co-op apartment, cooperative, landominum, equity, trigonometry, legs, hypotenuse, pitch, rise, run, similar, proportion, means, extremes, angle of elevation, tangent, sine, cosine, inverse trigonometric functions, expected value

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the fact that within the next decade they will likely be in a position to purchase a home and to take on the responsibility that comes with it. They will learn about finding a place to live and what they need to know about rentals, co-ops, condominiums, or buying their own house. Measuring square footage with area formulas, calculating mortgage costs, and using trigonometry to handle home

improvements are all key topics. The main purpose of this unit is to know the ins and outs of buying and maintaining a home.

This unit is broken down into the following sections:
7.1 - Finding a Place to Live
7.2 - Repairing a Floor Plan
7.3 - Mortgage Application Process
7.4 - Purchasing a Home
7.5 - Mortgage Points
7.6 - Rentals, Condominiums, and Cooperative
7.7 - Home Maintenance and Improvement

The following vision of a learner attributes are assessed through the following summative activities:

TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students will write a paper about the rate of homeownership since the 1960s to today. The graph provided shows this changing amount as a line graph with varied peaks and gulleys. Additionally, shaded bands indicate times when the nation was going through an economic depression. Students should look to make connections between these times of economic depression and analyze other factors that cause the increase or decrease of home ownership percentage and make predictions about what that percentage may be when they are ready to buy a home. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study weights of various buildings as a context by which to do some spiral work with proportional reasoning and unit conversion. Amongst the questions asked of students are conversions between pounds and ounces, percent increases and decreases, and setting up a proportion.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 8 - The Stock Market

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and key assignments in the Stock Market unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R*.
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that...	**Essential Questions:**
● Investing can help make your money grow, and there is no limit to that amount of growth, but you also run the risk of losing your investment. ● There is a need to find a good balance between	● What are stocks? ● How is stock data presented and used to make wise investments? ● What fees and interest is involved with stock?

high-risk/high-reward and low-risk/low-reward investments. ● With a strong knowledge of the stock market, cooperations, and investment strategies, you as an investor can make decisions that are based on experience, data, trends, and mathematics.	
Students will know... ● The basic vocabulary of business organizations ● What information can be gleaned from a stock bar chart ● What information can be gleaned from a stock candlestick chart ● What it means to smooth data ● The significance of stock market ticker information ● The definitions of basic vocabulary of the buying and selling shares of stock ● The definitions of basic vocabulary of the buying and selling shares of stock ● How shareowners may split the profit of the corporation they own	**Students will be able to...** ● Compute financial responsibility of business ownership based on ratios and percentages ● Use stock data to follow the daily progress of a corporate stock ● Write spreadsheet formulas ● Create a stock bar chart ● Create a stock candlestick chart ● Calculate simple moving averages using the arithmetic average formula and the subtraction and addition method ● Graph simple moving averages with a spreadsheet ● Create a scatterplot of stock closing prices ● Determine the linear, quadratic, cubic, and quartic regression equations for a set of stock closing prices and use this to extrapolate a closing price for a future date ● Determine the total value of a trade from ticker information ● Determine trade volumes from ticker information ● Interpret a scatterplot of stock closing prices ● Calculate gains and losses from stock trades ● Compute the fees involved in buying and selling stocks ● Calculate the post-split outstanding shares and share price for a traditional or reverse split ● Calculate the fractional value amount that a shareholder receives after a split ● Compute dividend income ● Compute the yield of a stock ● Compute the interest earned on corporate bonds
Key Vocabulary: capital, sole proprietorship, profit, personally liable, partnership, corporation, shares of stock, shareholders, limited liability, private cooperation, public cooperation, stock market, trades, NYSE, NASDAQ, last, open, close, high, low, volume, sales in 100s, 52-week high, 52-week low, net change, after-hours trading, securities industry, Securities and Exchange Commission(SEC), Initial Public Offering(IPO), stock chart, stock bar chart, candlestick chart, smoothing techniques, simple moving average(SMA), lagging indicators, fast-moving average, slow-moving average, crossover, Dow Jones Industrial Average (DJIA), ticker, stock symbol, ticker symbol, shares traded, trading price, directional arrow, total value of a	

trade, uptick, downtick, money flow, positive money flow, negative money flow, daily money flow, net money flow, trade, portfolio, round lot, odd lot, mixed lot, capital gain, short-term capital gain, long-term capital gain, Schedule D: Capital Gains and Losses, capital loss, cost basis, amount realized, stockbroker, broker fee, discount broker, financial advisor, management fee, fiduciary, amount realized, churning, online brokerage house, full-service broker, at the market, limit order, cost basis, stock split, outstanding shares, market capitalization, traditional stock split, reverse stock split, penny stock, fractional part of a share, split-adjusted share price, dividend, dividend income, income stock, yield, growth stock, preferred stock, common stock, corporate bond, face value, par value, matures, coupon rate, mutual fund, no-load mutual fund, price-earnings ratio

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the world of investing. Students investigate different types of businesses with a focus on cooperations and their shareholders. Students learn about the procedures for buying and selling stock, the fees associated with this, and how stock tickers display information about stock prices. The unit also covers different ways of making money from stock trading. The main purpose of this unit is to provide students a basic knowledge of stock trading.

This unit is broken down into the following sections:
8.1 - Business Organization

8.2 - Stock Market Data
8.3 - Stock Market Data Charts
8.4 - Trends in Stock Closing Prices
8.5 - Stock Market Ticker
8.6 - Stock Transactions
8.7 - Stock Transaction Fees
8.8 - Stock Splits
8.9 - Stock Dividends and Bond Interest

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will write a paper about a graphic displaying changes to the value of the stock market over a single day's time, more specifically, within a half hour time. Students will need to predict what occurred that produced that data representation shown, and rationalize the peaks and gulleys within the data. They should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the concepts of exponential growth as it relates to the company google. The growth of the google cooperation is large in magnitude, making its name, which is derived from googl, the number 10^100, quite appropriate. Students will investigate the doubling effect of a small quantity to see how exponential growth differs significantly from linear growth and answer questions relating to very large values.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 9 - Mathematically Modeling a Business Start-Up

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and key assignments in this unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
- A-REI1-Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- A-REI2-Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-REI4b-Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
- A-REI6-Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A-REI7-Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = -3x and the circle x2 + y2 = 3.
- A-REI10-Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- A-REI11-Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find

successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

- A-REI12-Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF5-Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q2-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- S-ID3-Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID5-Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit.
- S-ID9-Distinguish between correlation and causation.
- S-IC1-Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
- S-IC3-Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

- S-IC5-Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
- S-CP1-Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
- S-CP3-Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
- S-IC3-Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
- S-IC4-Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
- S-IC5-Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
- N-CN1-Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
- N-CN7-Solve quadratic equations with real coefficients that have complex solutions.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
CCE4(9-12): I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.

Understandings: Students will understand that...
- Creating a business model allows a person to use variables and examine relationships among those variables to make predictions that will help maximize profit.
- Without a model, a person can invest time, money, and effort in a business that will not be successful.

Essential Questions:
- What do I need to know to start my own business?
- How can I assure that my business is successful?

Students will know...
- The process for choosing sample subjects without bias
- Various methods used to reduce bias in experiments
- If a statistic is biased or unbiased
- The significance of the slopes of supply and demand curves
- Definitions and specific examples of fixed and variable expenses
- The definition of revenue breakeven points and how to determine them
- The transitive property of dependance as it is used by a

Students will be able to...
- Use a random number table
- Create diagrams for experimental designs
- Compute combinations
- Compute unbiased estimators
- Critique sampling techniques
- Find points of equilibrium
- Create an expense equation based on fixed and variable expenses
- Write, graph, and interpret expense and revenue functions

business owner	• Factor a quadratic using various methods • Determine the breakeven prices and amounts using technology or algebra • Determine a profit equation given the expense and revenue functions • Determine the maximum profit and the price at which the maximum profit is attained • Identify breakeven points and explain them in the context of a situation • Determine complex roots of a quadratic equation • Use multiple sources of information, functions, and methodologies to model a new business • Use linear programming • Write an objective function • Construct a feasible region given constraints • Maximize an objective profit function • Minimize an objective expense function

Key Vocabulary:
patent, trademark, bias, question-wording bias, random number table, experiment, randomization, replication, control group, placebo, experimental group, completely randomized design, matched-pairs design, observational study, hypothesis, hypothesis testing, population, sample, focus group, inferential statistics, convenience sample, replacement, combination, factorial, simple random sample(SRS), stratified random sample, undercoverage, nonresponse, unbiased estimator, widget, demand function, demand, supply, wholesale price, markup, retail price, equilibrium, variable expenses, fixed expenses, expense function, revenue, revenue function, breakeven point, nonlinear function, second-degree equation, quadratic equation, parabola, leading coefficient, minimum, vertex, maximum, axis of symmetry, roots, zeros, quadratic formula, perfect square trinomial, completing the square, zero net difference, profit, maximum profit, complex roots, complex number, imaginary unit, bankruptcy, dependance, transitive property of dependance, linear programming, optimal outcome, constraints, polygonal region, objective function, feasible region, boundless feasible region

Assessment Evidence

Performance Tasks: A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include: • Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. • “You Write the Story!” - Activities that ask students to examine a	**Other Evidence:** • Warmup problems provided in each lesson • Checks for understanding provided in each lesson • Book application problems

graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Learning Plan

This unit introduces students to the process to take a business idea from just a thought to a tangible, profitable operation. Students become familiar with terminology including fixed and variable expenses, supply and demand, revenue, profit, and expense functions, etc. The unit culminates with a full drawn out business model for a hypothetical business using linear programming to maximize profit and minimize costs. The main purpose of this unit is to empower students to pursue their passions in such a way to be their own boss.

This unit is broken down into the following sections:
9.1 - Inventions
9.2 - Market Research
9.3 - Supply and Demand
9.4 - Fixed and Variable Expenses
9.5 - Graphs of Expense and Revenue Functions
9.6 - Breakeven Analysis
9.7 - The Profit Equation
9.8 - Mathematically Modeling a Business
9.9 - Optimal Outcomes

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
CCE4(9-12): I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.

You write the story: Students will produce a news article about data shared regarding a typical failure rate of products over time. Students will see a "bathtub curve" named so because some products fail immediately, but those that don't have an initial defect tend to last much longer, up to

a point. Students will consider what factors affect the start, middle, and end of this type of relationship over a time period. The example provided shows a 5 year time frame, but the concept can be generalized to any duration. Students should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the value of collectible cars in various conditions over time. Data from Ford Motor Company is provided for students to utilize on the value of 1958 Edsel Villager 9-Passanger Wagons. Students will determine specific values based on conditions and consider profit earned after investing in cars at various times before writing generalized equations to model the values of these cars over multiple variables. Further research on the car itself is considered an extension to this assignment.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 10 - Planning for Retirement

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities and projects inherent in studying retirement planning are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-IF7d-Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.
- F-LE2-Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- S-MD1-Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
- S-MD2-Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
- S-MD4-Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?
- S-MD5-Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)

CCE3(9-12): I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
TI4(9-12): I can apply my strengths and anticipate challenges to reach my current and future goals.

Understandings: Students will understand that...

- People need to start planning for retirement early in their working life so that they can afford the expenses they will still have after they stop working.
- There are retirement savings accounts, pension plans, and Social Security options for retirees.
- It is important to become knowledgeable about the pros and cons of each type of retirement plan so you are ready when you retire.

Essential Questions:

- Why and how should you save for retirement?
- What role do the government and my employer play in helping me prepare for retirement?

Students will know...

- The definition of an annuity
- The benefits that are paid by Social Security
- How social security benefits are computed
- The advantages and disadvantages of different types of life insurance
- The advantages and disadvantages of different types of investments

Students will be able to...

- Calculate future values of retirement investments that are both single deposit and periodic
- Calculate the tax savings by making contributions to pre-tax retirement savings accounts
- Calculate an employer's matching contribution to a retirement account
- Calculate annuity payouts over time
- Calculate retirement account withdrawals using a traditional or proportional approach
- Compute federal income tax on benefits that are paid under Social Security
- Calculate pension benefits using during and after vesting periods
- Compute the cost of different types of life insurance
- Integrate different investment types to create portfolios with long- or short-term goals

Key Vocabulary:
retirement, semi-retired, pre-tax dollars, after-tax investments, individual retirement account(IRA), traditional IRA, tax-deferred, Roth IRA, tax-exempt, 401(k), SEP IRA plan, SIMPLE IRA plan, 403(b), traditional withdrawal approach, proportional withdrawal approach, annuity, inheritance, beneficiaries, last will and testament, trust agreement, trust, trustor, trustee, Old-Age, Survivors, and Disability Insurance(OASDI), Social Security benefit, full retirement age, Social Security statement, Special Security credit, average indexed monthly earnings(AIME), primary

insurance amount(PIA), bend points, deferred compensation, pension, defined benefit plan, vested, Pension Benefit Guaranty Cooperation(PBGC), Employee Retirement Income Security Act(ERISA), Pension Protection Act, cost-of-living adjustment(COLA), Consumer Price Index(CPI), beneficiary, premium, actuary, mortality table, mortality rate, face value, term life insurance, group term life insurance, level term insurance, decreasing term insurance, increasing term insurance, permanent life insurance, whole life insurance, cash value, universal life insurance, variable life insurance, greater integer function, expected value, diversify, volatility, aggressive investment, conservative investment, liquidity, speculative stock, cryptocurrency, blockchain technology, bitcoin, satoshi

Assessment Evidence

Performance Tasks:
A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:
Assessment Example.pdf

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the idea that it is never too early to start planning for retirement. Students will be introduced to various employer provided pensions and retirement savings plans. Life insurance is detailed as a way to provide financial security in the event of a loss. The main purpose of this unit is to give students the skills to create an investment portfolio that blends risk and duration(long-term and short-term) to personalize their savings retirement plan.

This unit is broken down into the following sections:
10.1 - Retirement Income from Savings
10.2 - Social Security Benefits

10.3 - Pensions
10.4 - Life Insurance
10.5 - Investment Diversification

The following vision of a learner attributes are assessed through the following summative activities:

CCE3(9-12): I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
TI4(9-12): I can apply my strengths and anticipate challenges to reach my current and future goals.

You write the story: Students will produce a news article about the change in both age and gender in the work force from 1950 through projected data for the year 2050. Students will discuss how this change relates to social factors, what the implications are, and what it tells us moving forward. Students should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the data from the U.S. Census Bureau about the number of people who are 65 and over, 85 and over, and 100 and over from 2016 projected out to 2060. Since average life span is important when thinking about retirement, it is valuable for students to extrapolate how old they can expect to live until so they can budget their retirement between when they stop working through the rest of their life. Followup questions after an analysis of this data include a graph and regression of average life span.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 11 - Preparing a Budget

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
The problems, activities, and projects inherent in studying budgeting are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*.
- A-REI10-Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF5-Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-IF7d-Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-VM6-Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.
- N-VM7-Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
- N-VM8-Add, subtract, and multiply matrices of appropriate dimensions.
- N-VM-9-Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still

satisfies the associative and distributive properties.
- N-VM10-Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...	**Essential Questions:**
• Budgeting provides a clear picture of how much you are spending and what you are spending it on. • Whether you are planning for just yourself, or for an entire family, a solid budget makes both sense and cents.	• How do you organize all your expenses so you can spend accordingly? • How do you plan for expenses, reduce debt, and grow savings using a budget?
Students will know... • The aspects of different plans for electronic services to make an informed decision about which to choose • Various methods to visualize and interpret a budget using a circle graph, line graph, bar graph, and a budget line graph	**Students will be able to...** • Compute the cost of electricity, gas, oil, and water for your home • Compute the cost of using specific appliances for specific lengths of time • Compute the time it takes an energy-saving appliance to pay for itself • Compute the cost of cell phones, internet services, and cable television • Set up, graph, and interpret an average cost function • Create and use a budget check-off chart • Develop and interpret a cash flow chart, frequency budget plan, and a year-long expense budget plan • Determine the dimensions of a matrix • Add, subtract, and multiply matrices • Multiply a matrix by a scalar

Key Vocabulary:
utilities, meter, watts, kilowatt-hour(kWh), cubic foot, volume, ccf, therms, electronic utilities, budget chart, budget check-off chart, circle graph, line graph, bar graph, budget line graph, sectors, central angles, cash flow, cash flow analysis, 50-30-20 rule, emergency fund, prorate, envelope accounting system, frequency budget plan, year-long expense budget plan, net worth, assets, liabilities, debt reduction plan, debt-to-income ratio, array, rectangular array, matrix, budget matrix, dimensions,, entry, element, zero matrix, corresponding elements, scalar, scalar multiplication

Assessment Evidence	
Performance Tasks:	**Other Evidence:**

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include: ● Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. ● "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills. ● "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers. ● "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature. An example of these types of activities can be seen here: Assessment Example.pdf	● Warmup problems provided in each lesson ● Checks for understanding provided in each lesson ● Book application problems

Learning Plan

This unit culminates all the learning into this course. It is fitting that the study of budgets ends the course because all the budget categories were studied throughout the year. Students explored household expenses and how to interpret, construct, use, and modify various types of budgets. These budgets help students control cash flow and debt reduction. The main purpose of this unit is to tie together all the aspects of financial planning discussed in this course.

This unit is broken down into the following sections:
11.1 - Utility Expenses
11.2 - Electronic Utilities
11.3 - Charting a Budget
11.4 - Cash Flow and Budgeting
11.5 - Budget Matrices

The following vision of a learner attributes are assessed through the following summative activities:

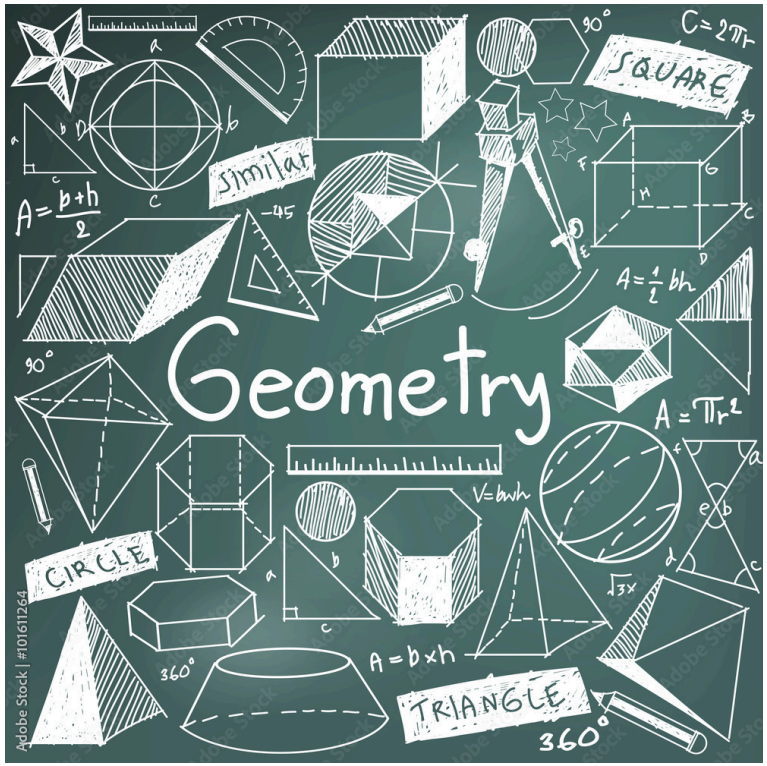
TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students will produce a news article about an infographic representing the balance of a budget over the course of a year. Analyzing a budget over the course of a full year is important since there are certain yearly expenses that cost more or less and repeat each year, such as holiday shopping or the cost to cool a home in the middle of summer. Students will write an article explaining the ramifications of considering a whole year for a budget and how this can help navigate times when one's budget seems to be abundant or diminishing. Students should use terminology and mathematical processes from the unit in their paper.
Really? Really! Revisited: Students will study the production of money. How is money produced, why can't we simply produce endless amounts of it, what backs it, and what can cause financial collapse? An array of questions and research done regarding the Bureau of Engraving and Printing will serve as the backbone for this project relating to the inherent value that is placed on physical currency.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at https://www.cengage.com that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

GEOMETRY CURRICULUM



Grade Level(s): 9-10

Curriculum Author(s): Jamie Lisevick and Kristen Pisano

Course Description: Geometry is a full-year course designed to increase the students' ability to reason intuitively, inductively, and deductively as they explore two and three-dimensional aspects of the world around them. Student learning in this course is investigative and cooperative with a heavy emphasis on data gathering, conjecture, and validation. Topics of study include: congruence, similarity, right triangle trigonometry, solid geometry, coordinate geometry, circles, and probability. The honors course is designed and implemented so that the depth of the topics discussed in the course surpass that of the college prep course to include the following: extensions of learning, accelerated pacing, greater complexity in topics, and greater responsibility, creativity, and reflection on the part of the students as their thinking is challenged.

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner Attribute and Indicator**
Foundations of Geometry	What is Geometry?	Geometry is built on precise definitions, postulates, clearly defined terms and logical reasoning.	TCC1(9-12); CCE2(9-12); P3(9-12)
Tools for Reasoning and Constructions (Honors Only)	How can inductive and deductive reasoning help us form logical arguments?	Geometry is built on logical reasoning and proof involving definitions, postulates, and theorems.	TI3(9-12); AA1(9-12); AA2(9-12)
Properties of Triangles	In what ways can geometric figures be used to understand real-world situations?	Geometric definitions, properties and theorems allow one to describe, model, and analyze situations in the real-world.	TCC1(9-12); TCC4(9-12); CCE2(9-12); TI3(9-12)
Triangle Congruence	How can we use the fact that two triangles are congruent to solve problems?	Proving and applying congruence provides a basis for modeling situation geometrically	TCC1(9-12); TCC4(9-12); CCE2(9-12); TI3(9-12)
Similarity and Proportional Reasoning	What additional insights can be understood and used to solve problems once it is established that two figures are similar?	Dilations, similarity, and the properties of similar triangles allow for the application of trigonometric ratios to real-world situations (ie. scaling maps, architecture)	TCC1(9-12); TCC4(9-12); CCE2(9-12); TI3(9-12)
Right Triangles and Trigonometry	How do the properties of right triangles help us solve real-world situations?	Pythagorean theorem, Special Right Triangles and Trigonometric Ratios, and Geometric Means can be used to solve real world problems.	TCC1(9-12); TCC4(9-12); CCE2(9-12); TI3(9-12); AA2(9-12)

Circles and Conic Sections	How do the unique properties and relationships of circles help us model, measure and apply to the real-world?	Circles have special properties and relationships among angles, arcs, chords, tangents and segments that help us model, measure, and analyze round objects and patterns in the world around us.	CCE2(9-12); AA1(9-12)
Area, Surface Area, Volume & Probability	How can we measure and describe three-dimensional objects to understand, design, and solve problems in the real world?	Surface area and volume help us describe, measure, and analyze three-dimensional objects so we can understand their structure, compare their sizes, and solve real-world problems involving space and materials.	CCE2(9-12); AA1(9-12); TI3(9-12)

Unit 1 - Foundations of Geometry

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- **G.CO.C.9** Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
- **A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- **A.REI.B.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- **G.GPE.B.6** Find the point on a directed line segment between two given points that partitions the segment in a given ratio. ★
- **A.REI.B.4.B** Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
- **F.IF.C.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- P3(9-12): I can accept constructive feedback and use setbacks to adjust my learning journey in order to reach my goals.

Understandings: Students will understand that...	**Essential Questions:**
• Geometry is built on precise definitions, postulates, clearly defined terms and logical reasoning. • Vocabulary describes geometric terms presented both verbally and visually. • Geometric statements are represented by diagrams and specific labels. • Relationships between geometric figures are based on measurable properties. • For Coordinate Geometry the distance formula is derived from the Pythagorean Theorem. ★	• What is Geometry? • How do we develop and extend our foundational concepts of Geometry? • What role does vocabulary and notation play in the understanding of Geometry? • What is the difference between congruence and equality? • How do we use the concepts of Geometry to solve problems? • How do we utilize principles of Algebra to model Geometry? • How to divide a segment or angles into a given ratio. ★
Students will know...	**Students will be able to...**
• State precise definitions of basic Geometry vocabulary. • How to identify, sketch basic vocabulary terms. • Read and write with geometric symbols (notation). • How to correctly name points, lines and planes, angles etc… • Recognize and apply basic properties of geometric figures • How to use and identify congruent segments and angles. • Understand and identify special pairs of angles, such as complementary, supplementary, vertical angles and linear pairs. • Measurements, definitions and labels must be precise in order to draw conclusions that are accurate. • Measure and compare segments and angles using appropriate tools (ruler, protractor).	• Know and apply vocabulary. • Identify and label geometric concepts given a diagram. • Create a sketch given notation with correct markings for parallel and perpendicular lines. • Write geometric statements using correct notation. • Use the order of operations to calculate the distance between two points with the distance formula. ★ • Calculate the midpoint between two points. ★ • Calculate the endpoint of a segment given a midpoint and one endpoint. ★

Key Vocabulary:

Geometry	Trisect ★	Linear Pair
Point	Partition	Vertical Angles
Line	Measure	Complementary Angles
Plane	Degree	Supplementary Angles
Space	Equidistance	Postulate

Segment	Midpoint	Segment Addition Postulate
Ray	Collinear	Angle Addition Postulate
Parallel Lines/Planes	Coplanar	Theorem ★
Perpendicular Lines/Planes	Endpoint	Pythagorean Theorem ★
Skew Lines	Congruence	Distance Formula ★
Angle	Acute Angle	Midpoint Formula ★
Vertex	Obtuse Angle	
Adjacent Angles	Straight Angle	
Angle Bisector	Right Angle	
Bisect	Reflex Angle ★	

Assessment Evidence

Performance Tasks:

- **Dictionary Project:TCC4(9-12)**
  Students will create a personalized geometry dictionary to deepen their understanding of key geometric terms by defining, illustrating, and providing a real-world example for each.

- **Summative Unit Assessment:** Topics will include:
  - Identifying, writing definitions, sketching with new geometric vocabulary.
  - Creating equations based on geometric diagrams including the segment and angle addition postulates, and angle pair relationships and solving with algebraic methods.
  - Using protractors and rulers for accurate measurement.
  - Applying formulas to coordinate plane problems. ★

Other Evidence:

- **Algebra Check in Quiz 1-1**: This will assess Algebra I skills at the start of the year including solving equations, combining like terms. *For honors only solving quadratic equations by factoring and square root method*.★

- **Concept Checks: P3(9-12)**
  Students will complete a small concept check on several topics throughout the unit including vocabulary knowledge and sketching diagrams, utilizing the distance formula and midpoint formula in coordinate geometry with real world problems.

- **Quiz 1-2**: This will assess the comprehension of the vocabulary and notations in written form. It will also assess the proper markings of diagrams. (parallel/perpendicular/congruence)

- **Quiz 1-3**: Students will create equations from relationships of angle pairs, bisected segments and more. They will apply algebraic reasoning and correctly use the order or operations when solving. (Honors only will include partitioned

	segments/angles as well as factoring involved in solving quadratic equations) ● **Vertical whiteboard warm-ups:** Student-led discussions regarding solutions or misconceptions. Given a multi-step problem which emphasizes depth or difficulty. These will be inquiry-based or application-heavy.

Learning Plan

Geometry is a branch of mathematics that studies shapes, sizes, positions, angles and dimensions of figures, objects and spaces. It focuses on the properties and relationships of points, lines, planes, and solids. It builds logical thinking and problem solving skills. The first unit covers the basic vocabulary, geometric notation, markings and basic postulates that are used in this branch of mathematics.

- Students will work on vertical white boards in small groups with the presentation: “Sketch It”. They will draw diagrams with markings based on the geometric notation given in written form.
- For the summative review students will work in small groups of 5 stations: Station 1: Vocabulary, Station 2: Drawing and Sketching, Station 3: Measurement, Station 4: Angels with Algebra, and Station 5: Coordinate Geometry. Answer keys are provided for each station and students can choose how much time and which different stations to work in. **CCE2(9-12)**
- Students will create a dictionary of terms from unit 1 (see “Dictionary Project” above). **TCC4(9-12)**
- Students will derive the distance formula from the pythagorean theorem by group led discussions. ★
- Students will be able to identify quadratic equations vs. linear equations. ★
- Students will review the structure of factoring. Factoring helps students to see structure and problem solve more efficiently. We will review a variety of techniques for factoring depending on the structure of the expression.★

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks.*

Unit 2 - Tools for Reasoning, Constructions & Transversals (Honors Only Unit)★

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- ***G.CO.D.12*** *Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*
- **G.CO.B.7** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
- ***G.CO.C.9*** *Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*
- ***A.REI.A.1*** *Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.* ***Construct a viable argument to justify a solution method.***
- ***A.CED.A.3*** *Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
- ***G.GPE.B.5*** *Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).*

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- AA1(9-12): I can evaluate different approaches and justify the best pathway to success.
- AA2(9-12): I can assess my past successes and mistakes to change my approach.

Understandings: Students will understand that...

- Geometry is built on logical reasoning and proof involving definitions, postulates, and theorems.
- Constructions are a physical form of proof, they demonstrate geometric truths without measurement, reinforcing the logic behind properties like congruent segments or perpendicular bisectors.
- Angle and line relationships reveal consistent patterns which can be proven using reasoning and used to solve real-world and abstract problems.
- Reasoning transfers across representations including visual diagrams, written proofs, and algebraic/graphical models (e.g., using slope to prove parallelism in the coordinate plane).
- There are some common misconceptions and missteps that students have/make with reasoning, constructions, and transversals:
    - Inductive reasoning leads to absolute truth (Theory vs Theorem).
    - Leaving out essential logical arguments from one step of the proof to the next. (i.e. assuming too much from a definition, postulate, theorem, and/or diagram)

Essential Questions:

- How can inductive and deductive reasoning help us form logical arguments?
- How can the order and/or negation of a statement impact its truth and persuasiveness?
- What role does algebraic properties have in the creation and flow of a geometry proof?
- What strategies can be utilized when proving mathematical statements?
- How can you use formulas and equations to model geometric terms analytically?
- In what ways can two or more lines be described in space?
- What are the various angle relationships given two or more lines and a transversal?
- What conditions are necessary for angle relationships to be either congruent or supplementary?
- How do you prove lines parallel or perpendicular?

Students will know…

- Inductive reasoning can lead us to believing a concept is true, but beware, we may have not thought of the counterexample yet.
- Deductive reasoning leads us to an absolute truth.
- Using the law of detachment simplifies proof writing by allowing the mathematician to utilize agreed upon notations and symbols.
- The law of syllogism is an essential strategy in proof writing to connect previous statements of logic to new ones.
- Mathematicians must be careful in the order and the phrasing of

Students will be able to...

- Understand the difference between inductive and deductive reasoning.
- Use the law of detachment to “personalize” a geometric statement.
- Use the law of syllogism to develop connections between two mathematical or geometric concepts.
- Write a statement in conditional form and investigate the converse, inverse, contrapositive, and bi-conditional forms.

a statement as it may impact the truth of the statement. • Proof writing is an art, taking on the personality of the writer, showcased through their style. • Angle relationships can be corresponding, alternate interior, alternate exterior, consecutive interior, consecutive exterior, vertical, or linear pairs. • Understand that an angle relationship exists regardless of the lines being parallel or perpendicular. • Given two lines are parallel, angles pairs are either supplementary or congruent based on their relationships to the transversal. • Slope can be calculated using the formula or by counting the rise and run. • Given three points, find the slope between each to determine if the points are collinear (or find the equation through two of the points and determine if the third point lies on the line). • Equations of lines can be written in standard form, point-slope form, and slope-intercept form. • Parallel lines have the same slope. Perpendicular lines have opposite, reciprocal slopes.	• Investigate the truth of various conditional statements. • Write proofs using columns, flow, paragraph, or hybrid styles involving previous unit concepts. • Prove theorems such as the Linear Pair Congruent Theorem, the Congruent Complement Theorem, Supplement Theorem, etc. • Know and apply the vocabulary of angle relationships, parallel, and perpendicular. • Create and solve problems using the corresponding angles postulate, alternate interior angles theorem, alternate exterior angles theorem, consecutive interior angles theorem, consecutive exterior angles theorem • Prove lines are parallel using postulates and theorems. • Calculate the slope of a line given two points or a graph. • Determine if 3 or more points are collinear (using slopes and/or equation of a line). • Write the equation of a line given two points. • Identify whether lines are parallel, perpendicular, or simply intersecting by comparing their slopes. • Calculate the distance from a point to a line. • Write the equation of a perpendicular bisector given a segment.

Key Vocabulary:

Inductive Reasoning	Conjecture	Alternate Interior Angles
Deductive Reasoning	Definition	Consecutive Interior Angles
Proof	Counterexample	Alternate Exterior Angles
Theorem	Two-Column Proof	Consecutive Exterior Angles
Hypothesis	Constructions	Coordinate Geometry
Conclusion	Reflexive Property	Slope/y-intercept
Negation	Symmetric Property	Equation of a Line
Conditional Statement	Properties of Equality	Slope Intercept Form
Biconditional Statement	Substitution Property	
Converse	Transitive Property	

Inverse Contrapositive	Transversal Corresponding Angles Postulate

Assessment Evidence

Performance Tasks:

- **Unit Summative Assessment: AA2(9-12)**
  The topics will include inductive vs. deductive reasoning, they will show their mastery of writing and reading proofs. These proofs will include the angle pair relationships discovered in this unit with transversal and parallel lines. This summative will include error analysis questions, matching or fill in the blank, algebra and coordinate geometry with linear equations and systems of equations, as well as summary.

- **Proof competition: AA1(9-12)**
  Students will work in small groups and practice formal geometric proof writing (two-column). This will deepen understanding of postulates, definitions and theorems, build teamwork and communication around mathematical reasoning. The groups will present a proof to the class and others may find errors as part of the competition.

Other Evidence:

- **Construction Quiz:** Students will create congruent segments and angles, along with equilateral triangles and 30, 45, 60 and 90 degree angles with their straightedge and compass only.

- **Syllogism Story:** Students will start a hypothesis and pass it around the class for each student making a conclusion and using transitivity to create a syllogism. Once every student has contributed the story will be read aloud.

- **Concept Checks:** Students will complete a small concept check on several topics throughout the unit including logic & conditional statements, writing equations of parallel and perpendicular lines and writing proofs based on a diagram.

- **Vertical whiteboard warm-ups:**
  Student-led discussions regarding solutions or misconceptions. Given a multi-step problem which emphasizes depth or difficulty. These will be inquiry-based or application-heavy utilizing methods from Building Thinking Classrooms.

Learning Plan

Unit 2 covers basic reasoning and logic and how it can be used to communicate clearly with others and prove theorems. Students will begin to use this way of reasoning to discover angle relationships created by parallel lines and a transversal.

- *Students will learn the rules and how to use a compass and straightedge as well as the history of the importance of this skill.*
- *Students will discover the angles relationships of transversals by using deductive reasoning.*
- *Students will use two-column proofs to prove lines are parallel.* **AA1(9-12)**

- *Angle relationships challenge problem: “No Joking Around” Students will solve for many missing angle measures that travel through multiple sets of parallel lines and transversals. This would be best at white boards or in partner work at desks.*
- *To better understand how two-column proofs work students will complete “Uno Proofs” slides to get the understanding.*
- *Logic Puzzles are a fun way to use deductive reasoning.*
- *Syllogism Story (As described above)*

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 3 - Properties In Triangles

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- G.CO.C.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
- G.CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*
- G.MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
- G.CO.C.9 Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
- G.GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for

success.

Understandings: Students will understand that...

- Geometric definitions, properties and theorems allow one to describe, model, and analyze situations in the real-world.
- Proving and applying congruence provides a basis for modeling situations geometrically.
- There are some common misconceptions and missteps that students have/make with properties in triangles.
    - The sum of the two smaller sides of a triangle must be larger than the third side. Students often think that sides 4, 4, 8 make an isosceles triangle because they forget that the two smaller sides cannot be equal to the largest side.
    - Students forget to use the exterior angle theorem as an appropriate strategy.

Essential Questions:

- In what ways can geometric figures be used to understand real-world situations?
- In what ways can congruence be useful?
- How can the measures of a triangle be used to classify triangles?
- What do the Triangle Theorems tell you about the attributes of a triangle?
- How do you know which theorem applies to the given situation?
- How can the triangle inequalities be applied to the construction of the triangle and extension to the theorems?

Students will know...

- How to correctly interpret geometric diagrams (what can and cannot be assumed)
- How to use theorems, postulates, or definitions to prove theorems about triangle, including:
    - Points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
    - Measures of interior angles of a triangle sum to 180 degrees
    - Base angles of isosceles triangles are congruent.
    - The segment joining midpoints of two slides of a triangle is parallel to the third side and half the length.
    - The Medians of a triangle meet at a point. ★

Students will be able to...

- Classify Triangles by their sides and angles
- Determine largest and smallest sides and/or angles using the triangle inequality theorem
- Perform constructions of angles, segment bisectors, perpendicular bisectors ★
- Apply the properties of geometric figure to comparable real-world objects (e.g., The zipper of a tent is an altitude and perpendicular bisector which makes it equidistant from the base angles of an isosceles triangle.)
- Solve for missing segments and angles based on the interior and exterior angle theorems
- Solve for missing sides and angles using the properties of line segments inside a triangle (and their points of concurrency★)

Key Vocabulary:

Acute Triangle	Median	Base Angles
Obtuse Triangle	Angle Bisector	Legs
Right Triangle	Perpendicular Bisector	Remote Interior Angles
Equilateral Triangle	Points of Concurrency ★	Equidistant
Isosceles Triangle	Concurrent ★	Consecutive
Scalene Triangle	Centroid ★	Midpoint
Equiangular Triangle	Circumcenter ★	Midsegment
Triangle Sum Theorem	Incenter ★	Adjacent
Exterior Angle Theorem	Orthocenter ★	Congruent
Triangle Inequality Theorem	Isosceles Triangle Theorem	
Altitude	Converse Isosceles Triangle Theorem	

Assessment Evidence

Performance Tasks:

- **Fox Project Part 1 TCC4(9-12)**
  - Students have a picture of a fox that can be broken down into all triangles. Students must identify all special line segments inside a triangle based on the notation and special properties
  - Students must identify and classify 6 triangles based on the properties of their sides and angles. Students must explain their selections using deductive reasoning and proven theorems.
  - Students must solve for missing angles using the sum of interior angle theorem and exterior angle theorem
  - Students must identify the longest/shortest sides and largest/smallest angles of a triangle using the triangle inequality theorem.
- **Fox Project Part 2: CCE2(9-12)**
  - Students must create their own scaled drawing of a person, animal, or thing using only triangles. At least one each triangle used must contain the following

Other Evidence:

- **Quiz 3-1**
  - Classify Triangles by Sides and angles: Scalene, Right, Obtuse, Acute, Equilateral, Isosceles
  - Give a range of possible 3rd sides given 2 sides of a triangle based on the triangle inequality theorem.
  - List sides in order from least to greatest given the angle measurements
  - List angles in order from least to greatest given the side measurements.
- **Quiz 3-2**
  - Solve for missing angles using the sum of interior angle theorem
  - Solve for missing angles using the exterior angle theorem
  - Solve for missing angles using properties of isosceles triangles.
- **Quiz 3-3**
  - Identifying special line segments in triangles

attributes:
    - Altitude
    - Midsegment
    - Angle Bisector
    - Acute Triangle
    - Obtuse Triangle
    - RIght Triangle
    - Equilateral Triangle
    - Isosceles Triangle
    - Median
    - Scalene Triangle
    - Perpendicular bisector
    - Accurate angle measurements

- **Airport Project ★ TCC4(9-12)**
    - Students will determine the cost of two different options for placing a new airport. They will use their knowledge of points of concurrency to locate the potential locations and through coordinate Geometry and constructions with their compass will determine the locations and costs for building new roads.
    - Solving for sides and angles using the properties of Altitude, Angle Bisector, Perpendicular Bisector, Median, and Midsegment.
    - Apply theorems and definitions to real world applications such as camping equipment, flight plans, etc.
- **Daily warm-ups**
    - Here's where we've been and where are we going, what are the similarities and differences?
    - Student-led discussions regarding solutions
    - Discussions regarding student misconceptions
    - Examples of student work, find the mistake and describe
- **Daily homework discussion**
- **Concept Checks**
    - Students have the opportunity to receive feedback and rework questions to improve understanding

Learning Plan

- Students will review the properties of sides and angles in order to classify triangles as Scalene, Equilateral, Isosceles, Right, Obtuse, Acute.
- Students will discover the triangle inequality theorem using the pasta activity in which students explore what sides can or cannot make a triangle **TI3(9-12)**
- Students will Prove the sum of interior angles theorem using prior knowledge of parallel lines and transversals and supplementary angles★ and practice solving for angles algebraically **TI3(9-12), TCC1(9-12)**
- Students will participate in Vertical white board collaborative practice utilizing methods from Building Thinking Classrooms **TI3(9-12)**
- Students will discover the exterior angle theorem using knowledge of sum of interior angles and supplementary angles.
- Students will discover and learn special line segments in triangles and their properties using a Desmos Activity **TI3(9-12)**
- Students will construct special line segments in triangles using a ruler and a compass★ (Median, Altitude, Angle Bisector, Perpendicular Bisector, Midsegment)
- Students will solve for missing segments and angles in triangles using the above listed properties and theorems
- Students will solve for the distances between the vertices of a triangle and its points of concurrency.★

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 4 - Triangle Congruence

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.CO.B.7** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
- **G.CO.B.8** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
- **G.CO.C.9** Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
- **G.SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- **G.CO.C.11** Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- P3 (9-12): I can accept constructive feedback and use the setbacks to adjust my learning journey in order to reach my goals.

Understandings: Students will understand that...

- Proving and applying congruence provides a basis for modeling situation geometrically
- There are some common missteps that occur when proving congruence:
  - Students may reverse the roles the law of detachment and law of syllogism play in the development of proof writing.
  - Students may leave out essential logical arguments from one step of the proof to the next (i.e. assuming too much from a definition, postulate, theorem, and/or diagram.
  - Students may forget to mark all of the given information on the diagram.

Essential Questions:

- In what ways is congruence useful?
- What information is essential to prove triangles are congruent?
- How can the movement of shapes preserve congruence and/or similarity?
- How can we use the fact that two triangles are congruent to solve problems?

Students will know...

- Congruent figures are the same shape and same size regardless if they are translated, rotated or reflected.
- How to interpret geometric diagrams
- Think critically and deductively to write formal proofs to prove congruent triangles by SSS, SAS, ASA, AA, and HL.
- Prove that parts of Triangles and parallelograms are congruent due to Corresponding parts of Congruent Triangles are congruent (CPCTC).

Students will be able to...

- Identify corresponding sides and corresponding angles of congruent figures
- Explain that in a pair of congruent triangles, corresponding sides are congruent (distance is preserved) and corresponding angles are congruent (angle measure is preserved.
- List sufficient conditions to prove triangles are congruent
- Map a triangle with one of the sufficient conditions (SSS, SAS, ASA, AAS, HL) onto the original triangle and show that corresponding sides and corresponding angles are congruent
- Write a formal proof providing statements with correlated reasons starting with a set of given information and ending with a proven statement.
- Identify and use the properties of congruence and equality (reflexive property, symmetric, transitive, definition of midpoint,

	definition of angle bisector, parallel line relationships, vertical angles, etc) in proofs ● Order statements based on inductive reasoning ● Correctly interpret geometric diagrams by identifying what can and cannot be assumed

Key Vocabulary:

Congruence	SAS	Transversal
Distance	ASA	Alternate Interior Angles
Map	AAS	Corresponding Angles
Figure	SSS	Parallel
Corresponding Sides	HL	Angle Bisector
Corresponding Angles	Right Triangle	Segment Bisector
Triangle	CPCTC	Midpoint
Parallelogram	Proof	
Translation	Reflexive Property	

Assessment Evidence

Performance Tasks:

- **Unit Summative Assessment:** TCC4(9-12)
  - Using Angle relationships with parallel lines and transversals to solve for missing angles and prove congruent triangles
  - Identifying corresponding parts of Congruence triangles, interpreting and writing congruence statements
  - Explain whether a pair of triangles are congruent or not using one of the sufficient conditions (SSS, SAS, ASA, AAS)
  - Create formal proofs for congruent triangles using SSS, SAS, ASA,, AAS, HL, and CPCTC by placing the correct sticker statements with the correct sticker reason and accurately identifying congruent parts of a diagram and what information can be assumed.

Other Evidence:

- **Quiz 4-1 Intro to Congruent Triangles**
  - Identify corresponding parts of congruent figures
  - Solve algebraically for missing sides and angles of Congruent triangles using congruence statements, notation and corresponding parts.
  - Explain whether a pair of triangles are congruent or not using one of the sufficient conditions (SSS, SAS, ASA, AAS)
  - Write a congruence statement for congruent triangles
- **Quiz 4-2: Partner Sticker Quiz** TCC4(9-12)
  - Students collaborate to create formal proofs for congruent triangles using SSS, SAS, ASA, AAS, HL, and CPCTC by placing the correct sticker statements with the correct sticker reason and accurately identifying

○ Use properties of Congruent triangles to prove properties of parallelograms	congruent parts of a diagram and what information can be assumed. ● **Quiz 4-3 Quadrilaterals and Parallelograms** TCC4(9-12) ○ Use properties of Congruent triangles to prove properties of parallelograms. ○ Use properties of parallelograms, kite, and trapezoid to solve for missing sides and angle measures algebraically ○ Use midsegment of trapezoid to solve for missing parts ● **Daily warm-ups** ○ Here's where we've been and where are we going, what are the similarities and differences? ○ Student-led discussions regarding solutions ○ Discussions regarding student misconceptions ○ Examples of student work, find the mistake and describe ● **Daily homework discussion** ● **Concept Checks** P3(9-12) ○ Students have the opportunity to receive feedback and rework questions to improve understanding

Learning Plan

- Students will be utilizing previous knowledge on parallel lines and transversals from Unit 2 to prove congruent triangles.
- Students will work will discover Congruent triangles as same size and shape in Triangle Congruence Introduction Desmos TCC1(9-12)
- Students will discuss and discover Congruence shortcuts in a small group activity in which they must create a congruent triangle to their partner's by asking the fewest questions about the triangle. TI3(9-12)
- Students will practice using SSS, SAS, AAS, ASA, in Triangle congruence Practice Desmos
- Students will participate in Vertical white board collaborative practice utilizing methods from Building Thinking Classrooms TI3(9-12)
- Students will develop skills with a partner and gain immediate feedback completing Desmos: Fill in the Blanks Proofs
- Students will develop skills with a partner and gain immediate feedback completing Desmos: Proofs with CPCTC TI3(9-12)
- College Prep classes will complete interactive notebook pages for each skill set CCE2(9-12)
- Students will complete collaborative around the room Math Lib review activity CCE2(9-12)

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 5 - Similarity and Proportional Reasoning

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.SRT.A.1.B** The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- **G.SRT.A.2** Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
- **G.SRT.A.3** Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar
- **G.SRT.B.4** Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
- **G.SRT.B.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.

Understandings: Students will understand that...	**Essential Questions:**

• Dilations, similarity, and the properties of similar triangles allow for the application of trigonometric ratios to real-world situations (ie. scaling maps, architecture)
• There are some common misconceptions and missteps that students have/make with similarity and proportional reasoning:
  ○ Students often mistake area factors as being equivalent to the scale factor.★
  ○ Students Incorrectly identify corresponding parts of diagrams when setting up proportions.
  ○ Students often forget that the proportionality of the parallel lines in overlapping triangles are not equivalent to the proportionality of the parts (Side Splitter).
  ○ Students forget to factor before simplifying ratios.★
  ○ Students often try to cancel out terms such as canceling the x in (x+1)/x instead of canceling out factors. ★
	• How might the features of one figure be useful when solving problems about a similar figure?
	• What does it mean to be similar in the context of Geometry?
	• How can the movement of shapes preserve congruence and/or similarity?
	• How are ratios, scale factors, and proportions similar/different from each other and how can they be used to solve problems?
	• What additional insights can be understood and used to solve problems once it is established that two figures are similar?

Students will know...	**Students will be able to...**
• Use the cross-product property and algebraic properties (including factoring★) to solve proportions. • Understand ratios and proportionality to solve a wide variety of problems. • Use the fact that two figures are similar when corresponding angles are congruent and corresponding sides are proportional to solve problems. • Use the relationship that the perimeter ratio of two figures is equal to the scale factor and the area ratio of two similar figures is equal to the square of the scale factor. • SSS~, SAS~, and AA~ can be used to establish that two triangles are similar and students can use them to solve for missing values between the triangles. • The Angle Bisector of a Triangle and parallel lines within a triangle creates proportional relationships.	• Identify corresponding sides and corresponding angles of similar figures • Solve proportions • Solve real world problems (the golden ratios/recipes) using proportions. • Solve problems knowing two figures are similar involving angle measures, length of sides, perimeters, and areas. • Solve similarity problems involving algebra skills (including factoring a quadratic and solving a system★). • Prove two triangles are similar using AA, SAS, or SSS similarity. • Use the Proportionality of an Angle Bisector and the Proportionality of Parallel Lines (Side Splitter Theorem) to solve problems.

Key Vocabulary:

Dilation
Center
Scale Factor
Similarity
Corresponding Sides
Corresponding Angles
Triangle
Area Factor
SSS ~
SAS ~
AA ~
Center of Dilation
Cross Products
Ratio
Angle Bisector Theorem
Side Splitter Theorem
Parallel
Proportional
Reflection
Enlargement
Reduction

Assessment Evidence

Performance Tasks:	Other Evidence:
● **Similarity Choice Board Project CCE2(9-12)** ○ Students collaborate with a peer ○ Students choose 3 options of 7 mini projects ■ Scale a dinosaur ■ Similarity in pictures ■ Crazy horse: Real world architecture ■ Dinosaur Ratios ■ Scale a Barbie compared to a human ■ Scale a Business Logo ■ How much Dunkin: Use research, similarity and volume to determine how much coffee a Dunkin Truck can hold. ○ All projects assess student ability to apply the theorems of Similarity to think critically and solve real world problems.	● **Quiz 5-1 Proportional Reasoning TCC4(9-12)** ○ Use proportional reasoning for real world applications such as baking ○ Solve algebraically for missing sides and angles of Similar triangles ○ Explain what makes triangles similar using diagrams and notation ● **Quiz 5-2: Partner Sticker Quiz TCC4(9-12)** ○ Use similarity to determine heights of buildings and trees in real world applications ○ Prove triangles similar using SSS, SAS, AA ○ Use side splitter theorem and angle bisector theorem to solve for missing parts of similar triangles. ● **Daily warm-ups** ○ Here's where we've been and where are we going, what are the similarities and differences? ○ Student-led discussions regarding solutions ○ Discussions regarding student misconceptions ○ Examples of student work, find the mistake and describe ● **Daily homework discussion** ● **Concept Checks** ○ Students have the opportunity to receive feedback and rework questions to improve understanding
Learning Plan	

*Utilize this section for learning tasks that will be expected of **all** students enrolled in the course **no matter who is teaching the course**. These are the **common experiences** that all students will have. Essentially, these are the common formative assessments (CFAs) that all teachers will utilize. The expectation is that outside of these CFAs, teachers will use their autonomy to develop formative assessments that address their students' needs and interests. Modifications and accommodations should be made with the CFAs listed here for students with IEPs and 504s.*

- *Students must have the opportunity to practice and demonstrate the Vision of A Learner attributes throughout each unit, especially the skill-based attributes of "think critically and creatively," "collaborate and communicate effectively," and "take initiative."*
- *Utilize the VoL Teacher Website for ideas.*
- *Identify the attribute being practiced or demonstrated next to each learning task.*

- Students will discover the meaning of similarity through Scaling the GIant Desmos TCC1(9-12)
- Students will complete IXL activities using SImilarity Shortcuts with immediate feedback
- Students will practice using SSS, SAS, AA in Similarity Shortcuts Desmos
- Students will participate in Vertical white board collaborative practice utilizing methods from Building Thinking Classrooms TI3(9-12)
- Students will apply similarity to solve real world problems in indirect measurement Desmos TI3(9-12)
- Students will develop skills with a partner and gain immediate feedback completing Desmos: Proofs with CPCTC
- College Prep classes will complete interactive notebook pages for each skill set CCE2(9-12)
- Students will complete collaborative around the room Scavenger Hunt activity

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 6 - Right Triangles and Trigonometry

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.SRT.B.4** Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
- **G.SRT.C.6** Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
- **G.SRT.C.7** Explain and use the relationship between the sine and cosine of complementary angles.
- **G.SRT.C.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- CCE3(9-12): I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
- AA2(9-12): I can assess my past successes and mistakes to change my approach.

Understandings: Students will understand that...	**Essential Questions:**
• Proving and applying congruence provides a basis for modeling situation geometrically	• How do the ratios of special right triangles lead to the development of the trigonometric ratios?

• There are some common misconceptions and missteps that students have/make with right triangles and trigonometry:
  ○ Students forget to always put the value of the hypotenuse in for “c”, regardless of whether or not it is the unknown.
  ○ Students may mis identify the correct angle of depression when creating diagrams
  ○ Students often choose the incorrect trig function (sine, cosine, or tangent) when identifying the reference angle and corresponding sides (adjacent, opposite, hypotenuse).
	• How are side lengths or angle measures found in right triangles?
	• How do the properties of right triangles help us solve real-world situations?
	• How can you indirectly measure the height of an object that is too tall to measure directly?

Students will know... • The Pythagorean Theorem can be used to derive the side ratio relationships for isosceles right triangles and 30-60-90 triangles. • Apply the trigonometric ratios to acute angles. • Trigonometric ratios can be used to find side lengths when angle measures are known. • Sine (theta) = opposite/hypotenuse • Cosine (theta) = adjacent/hypotenuse • Tangent (theta) = opposite/adjacent • Inverse trig ratios can be used to find the missing angle measure when sides are known. • The angle of elevation and angle of depression are alternate interior (congruent) angles.	**Students will be able to...** • Use pythagorean theorem to solve real world problems • Use pythagorean theorem to prove the distance formula • Simplify Radicals and rationalize the denominator to produce simplified exact answers when using Pythagorean Theorem and special right triangles. • Recognize patterns utilizing the Pythagorean Theorem within two right triangles known as the special right triangles. • Solve problems involving special right triangles in the most efficient way possible by utilizing the identified patterns. • Find the sine, cosine, and tangent of an acute angle. • Calculate side lengths using trigonometric ratios • Find angle measures in right triangles using trigonometric ratios. • Apply trig ratios to real world problems • Identify the angle of elevation and angle of depression and use them to solve modeling problems.

Key Vocabulary:

Radical	Adjacent Side	Inverse Sine
Irrational	Special Right Triangles	Inverse Cosine
Exact	30-60-90 Triangle	Inverse Tangent

Approximate	45-45-90 Triangle	Angle of Elevation
Rationalizing the Denominator	Sine	Angle of Depression
Pythagorean Theorem	Cosine	Reference Angle
Converse of the Pythagorean Theorem	Tangent	*Means* ★
Distance Formula	Opposite Side	*Extremes* ★

Assessment Evidence

Performance Tasks:

- Right Triangles Project Part 1: TCC4(9-12)
  - Real world applications in which student must decide what the appropriate method to solve is: Pythagorean theorem, special rights, or Trigonometry
  - Draw and label a diagram to represent each situation
- Right Triangles Project Part 2: Choice Project CCE3(9-12)
  - Students choose 2 projects from 4 mini project choices
    - Pythagorean Instagram: Prove Pythagorean theorem using real world examples
    - Trigonometry Brochure
    - Comic Education
    - Create an assessment with answer key

Other Evidence:

- **Quiz 6-1 Pythagorean Theorem and Its Converse**
  - Use Pythagorean theorem and distance formula to solve real world applications
  - Given three side measures of a triangle, identify if it is Right, Obtuse, or Acute using the converse of the Pythagorean theorem.
  - Simplify radicals, leave answers in exact simplified form
- **Quiz 6-2: Special Right Triangles**
  - Solve for missing sides of 30-60-90 and 45-45-90 right Triangles without using pythagorean theorem
  - Show exact simplified answers
  - Apply special right properties to real world situation regarding rectangles and squares
- **Quiz 6-3 Trig Functions**
  - Identify trig ratios using acute angles
  - Solve for sides with the variable in the numerator and denominator of the trig ratio using Sine, Cosine, Tangent
  - Solve for angles in right triangles using Inverse Sine, Inverse Cosine, Inverse Tangent.
- **Daily warm-ups**
  - Here's where we've been and where are we going, what are the similarities and differences?
  - Student-led discussions regarding solutions
  - Discussions regarding student misconceptions

	○ Examples of student work, find the mistake and describe ● **Daily homework discussion** ● **Concept Checks** AA2(9-12) ○ Students have the opportunity to receive feedback and rework questions to improve understanding

Learning Plan

- Students will simplify radicals and rationalize the denominator to get exact simplified answers using pythagorean Theorem Desmos
- Students will solve real world problems working collaboratively in partner self checking activity.
- Students will discover the special right triangles rules using pythagorean theorem and similar triangles. TI3(9-12)
- Students will complete IXL and Khan Academy Practice with immediate feedback on Special Right Triangles
- Students will participate in Vertical white board collaborative practice utilizing methods from Building Thinking Classrooms TI3(9-12)
- Students will explore right triangle Trig Functions in Intro to Trigonometry Desmos TCC1(9-12)
- Students will Solve for missing Sides of right triangles given an angle and one side using Sine, Cosine, and Tangent
- Students will discover how to solve for a missing angle in a right triangle using Math medic Exploratory activity introducing Arcsin, Arccos, Arctan TCC1(9-12)
- College Prep classes will complete interactive notebook pages for each skill set CCE2(9-12)
- Students will collaborate to complete a math lib around the room review AA2(9-12)

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 7 - Circles & Conic Sections

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.CO.A.1** Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- **G.CO.A.2** Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
- **G.C.A.1** Prove that all circles are similar.
- **G.C.A.2** Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
- **G.C.A.3** ★ Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
- **G.C.A.4 (+)** ★ Construct a tangent line from a point outside a given circle to the circle.
- **G.C.B.5** Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
- **F.TF.A.1** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
- **G.GPE.A.1** Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
- **G.GPE.B.4** For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point (0, 2).

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.

- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.
- TI3(9-12): I can formulate and investigate probing questions to further my learning.
- AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

Understandings: Students will understand that...

- A circle is defined as the set of all points in a plane that are a fixed distance (radius) from a given point (center).
- The relationship between lines and circles including the relationship between tangent lines and radii.
- The relationship between arcs and angles.
- How to calculate segment lengths and angle measures formed by chords, secants, tangents and intersecting lines.
- How to solve real world problems utilizing the properties of circles.
- There are some common misconceptions and missteps that students have/make with circles and conic sections:
    - Students may forget to square the radius when writing the equation of a circle.
    - Students may use central angle properties for inscribed angles.

Essential Questions:

- What are the characteristics of a circle?
- What notations do we use when working with circles?
- What types of angles exist in a circle and how do they relate to their intercepted arcs?
- Why is it important to know properties of chords and tangents of circles?
- How are the measures of central and inscribed angles related to their intercepted arc, and where is this used in geometry?
- How are the measures of interior and exterior floating angles related to their intercepted arcs, and where is this used in geometry?
- What is the distinction between arc measure and arc length and how is arc length related to circumference?
- What types of lines and segments exist in a circle and what relationships exist in terms of their measures?
- How do you represent a circle using Analytical Geometry?

Students will know...

- A circle is made up of a set of points equidistant from a center.
- Notation communicates the knowledge you are sharing.

Students will be able to...

- Identify characteristics of a circle.
- Use appropriate notation for circles, arcs, chords, tangents, and

• The location of angles created by segments about a circle determine how you calculate arc measure. • Power Theorems allow you to find lengths of chords and pieces of secants. • The definition of a circle can be modeled with algebra.	secants. • Use central, inscribed, inside, and outside angles to determine arc measure • Use Power Theorems to find lengths of chords and pieces of tangents and secants. ★ • Students will represent a circle using Analytical Geometry. • Determine the location of a point given a circle equation.

Key Vocabulary:

Circle	Chord	Circumscribed Circle
Center	Sector	Segments of a Chord
Radius	Tangent	Standard Equation of a Circle
Diameter	Point of Tangency	External Segment
Arc Length	Central Angle	Focus
Arc Measure	Inscribed Angle	Directrix ★
Degrees	Inscribed Polygon	Parabola ★
Radians	Cyclic Quadrilateral	Hyperbola ★
Major Arc	Intercepted Arc	Ellipse ★
Minor Arc	Semicircle	

Assessment Evidence

Performance Tasks:	**Other Evidence:**
• **Unit Summative Assessment**: **AA1(9-12)** This will assess circle vocabulary and definitions, angles in circles both interior, on, and outside the circle, arcs and segments in circles (measure vs. length). Using radians as a form of measuring angles ★. It will also cover coordinate geometry with equations of circles, where students will create and read equations to locate center/radius and determine if a point is located on,interior or exterior the circle.As well as	• **Quiz 7-1:** Students will identify new circle vocabulary. They will solve for missing angles and segments utilizing the properties of circles. • **Quiz 7-2:** Students will be assessed on finding arc length including problems with more than one revolution. Honors will include radian measure. ★

real-world problems. This assessment will be set up with vocabulary matching or fill in the blank, error analysis question, multiple choice questions, Use the 4-step Process (Diagram, Geometric Statement and Reason, Algebra, and Summary) to solve problems. ● **Conic Sections Project: "Conics in the Real World" ★** (If time allows) **TCC4(9-12)** ○ Students will explore four conic sections - circle, ellipse, parabola, and hyperbola. ○ They will demonstrate their understanding by connecting the equations, features, and real-world applications of each through a visual written presentation.	● **Vertical whiteboard warm-ups:** Student-led discussions regarding solutions or misconceptions. Given a multi-step problem which emphasizes depth or difficulty. These will be inquiry-based or application-heavy utilizing methods from Building Thinking Classrooms. **TI3(9-12)** ● **Daily homework discussion** ● **Exit ticket** (Reflective Questions on what the student learned and what they need additional support on), Google Form, Concept Check, etc.

Learning Plan

Unit 7 is the study of circles and their properties and how they can be used in the real-world. Some applications include the fields of engineering, construction, art and physics. (E.g. Ferris wheels, gears, mandalas, domes, arches, roundabouts and turntables, pizza/pies/cakes, cans, cups, circular motion)

- *Students will use precise mathematical vocabulary to describe relationships between circle elements.*
- *Students will calculate arc measures and the measures of central angles.*
- *Students will solve for unknown angles formed by intersecting chords, tangents and secants in and around circles.* **TI3(9-12)**
- *Students will derive the formula for the equation of a circle through the pythagorean theorem.*
- *Students will communicate their understanding through discussion, diagrams, and written explanations.* **TCC4(9-12)**
- *Demonstration of radians, have the students use the wooden cut out unit circle to demonstrate the relationship between the radius and the circumference of a circle. ★*

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks, various Geometry textbooks*

Unit 8 - Surface Area & Volume

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

Common Core State Standards (*) indicates a modeling standard; (★ indicates greater emphasis in the Honors sections)

- **G.GMD.A.1** Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
- **G.GMD.A.3** Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
- **G.GMD.B.4** Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
- **G.MG.A.1** Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*
- **G.MG.A.2** Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*
- **G.SRT.D.9 ★(+)** Derive the formula A = (1/2)ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.
- **G.CO.D.13 ★** Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
- **S.CP.B.6** Find the conditional probability of A given B as a fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.
- **7.SP.C.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Large numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely or likely, and a probability near 1 indicates a likely event.
- **N.Q.A.2** Define appropriate quantities for the purpose of descriptive modeling.

Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.

- MP8: Look for and express regularity in repeated reasoning.

Vision of A Learner Attributes: Students will be able to independently use their learning to...

- CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.
- AA1(9-12): I can evaluate different approaches and justify the best pathway to success.
- TI3(9-12): I can formulate and investigate probing questions to further my learning.

Understandings: Students will understand that…

- Area formulas come from geometric reasoning. (for example how regular polygons can be derived by breaking it into congruent isosceles triangles.
- When doubling the side length, the effect on the perimeter is equivalent, but the area is four times as great.
- Three-dimensional shapes can be understood by their two-dimensional components such as nets and cross-sections.
- Formulas for surface area and volume are derived from geometric reasoning, rather than memorizing formulas, students should understand why they work and be able to adjust them as needed for irregular solids.
- Units matter and change with dimension, scaling dimensions affects surface area and volume differently.
- Connections to real-world modeling, packaging, construction, engineering, and efficiency problems.
- There are some common misconceptions and missteps that students have/make with surface area and volume:
    - Students may use the formula incorrectly using a side vs base of the solid
    - Students may mistakenly use the height of the face vs height of the solid.
    - Students may forget to include all parts of the formula in real-world problems (I.e. interior surface of a pool and they put the top in their solution).

Essential Questions:

-
- What do surface area and volume tell us about a 3D solid?
- In what ways can the sides of a solid be described?
- How do you calculate the surface area and/or volume of a solid when considering a real world situation?
- What are the similarities/differences between a solid and a polyhedron?★
- What unique polyhedrons exist and what makes them unique?★
- How can you use Geometric Probabilities to solve problems?

Students will know...	Students will be able to…
• The area of a sector is related to the area of a circle because of the relationship between the circle and the sector. • Convex polygons have angle measures that are less than 180°. Concave polygons contain at least one angle larger than 180°. • The exterior angles of a polygon always add to 360° • At each vertex, the exterior and interior angles form a linear pair. • Irregular polygons can be broken down into components of regular polygons. Estimation can be applied. • Surface area is the measurement of all the two-dimensional space that the surface of a three-dimensional shape takes up. • Volume is the amount of space an object occupies. • Composite figures help to model real-world phenomena. • Surface Area and Volume formulas need to be modified and/or adjusted when solving composite figures or real world problems. • *Geometric probability can be applied to length and area problems with connections made to the real-world. (i.e. time passed is similar to the concept of length).*	• Determine if a polygon is convex or concave • Determine if a polygon is regular • Find the sum of the measures of the interior angles and exterior angles of a polygon • Find the measures of one interior angle of a regular polygon • Find the number of sides a regular polygon has given one interior or exterior angle. • Calculate the area of irregular polygons. • Estimate area using a grid strategy. • Determine the change on perimeter and/or area given a dimension change in a polygon. • Calculate the area of a regular polygon given a radius or an apothem. • Derive the equilateral triangle volume formula. ★ • Discuss cross-sections and Cavalieri's principle. • Calculate the surface area of three dimensional figures. • Calculate the volume of three dimensional figures. • Calculate the surface area and volume of composite solids. • Solve real world problems. • To derive Euler's formula through inductive reasoning.★ • Compare and contrast solids, polyhedrons, platonic solids, and archimedean solids. ★ • Explain how probability can be represented as a ratio of areas in 2D figures or volumes in 3D figures • Understand that geometric probability involves comparing a target region to a total region. • Calculate the probability of a point landing in a specific region of a 2D shape by using area. • Solve real-world problems involving geometric probability in two dimensions (e.g., dartboard problems, shaded regions).

Key Vocabulary:

Polygon	Volume	Right Prism
Central angle of a polygon	Surface Area	Oblique
Apothem of a polygon	Net	Cross Section
Radius of a polygon	Face	Hemisphere
Pentagon	Edge	Sphere
Hexagon	Vertex	Great Circle
Heptagon	Euler's Formula	Similar Solids
Octagon	Base	Platonic solids
Nonagon	Lateral Area	Polyhedron
Decagon	Prism	
Dodecagon	Cylinder	
N-gon	Pyramid	
Convex	Cone	
Concave	Right Cone	

Assessment Evidence

Performance Tasks:

- **Unit Summative Assessment**: **CCE2(9-12)**
  This test will include calculating and adjusting formulas for area/surface area and volumes of solids. They will also solve real-world problems involving surface area and volume. They will calculate or analyze similar solids adjusting the scale factor for two or three-dimensions. They demonstrate conversions of units in 1/2/3 dimensions. This assessment will be set up with vocabulary matching or fill in the blank, error analysis question, multiple choice questions, Use the 4-step Process (Diagram, Geometric Statement and Reason, Algebra, and Summary) to solve problems.

- ***Polyhedron Project:*** **AA1(9-12)**
  *S*tudents will research a polyhedron that is not a platonic solid.

Other Evidence:

- **Quiz 8-1:** Students will calculate the area of polygons and solve problems involving interior and exterior angles of different polygons.

- **Quiz 8-2:** Students will be assessed on calculating surface area of prisms, cylinders, pyramids, cones and spheres. This check in will include irregular solids and applications of real-world problems.

- **Volume Discovery: TI3(9-12)** Students will use inductive reasoning to determine the formulas for volume of pyramids, cones and spheres using water or rice

- **Quiz 8-3:** Students will be assessed on calculating the volume

They will choose, research and create a physical solid for their polyhedron. The volume will be calculated by breaking it up into pyramids with a vertex at the center and will research a volume formula to compare. They will calculate the surface area in an organized fashion with correct formulas, units and labels. ★ (If time allows)	of prisms, cylinders, pyramids, cones and spheres. This check in will include irregular solids and applications of real-world problems. . ● **Vertical whiteboard warm-ups:** Student-led discussions regarding solutions or misconceptions. Given a multi-step problem which emphasizes depth or difficulty. These will be inquiry-based or application-heavy utilizing methods from Building Thinking Classrooms. ● **Daily homework discussion** ● **Exit tickets** (Reflective Questions on what the student learned and what they need additional support on), Google Form, Concept Check, etc.

Learning Plan

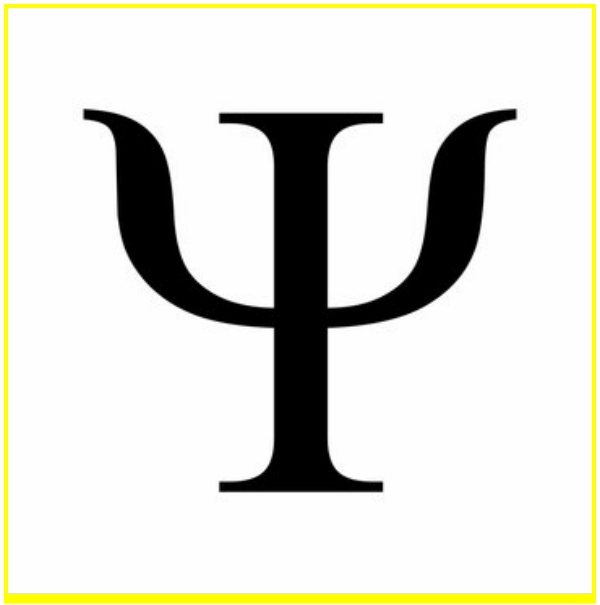
Unit 8 is the study of Solid Geometry, the branch of Geometry that deals with three-dimensional solids.

- Students will identify and describe three-dimensional figures, including prisms, pyramids, cylinders, cones and spheres.
- Students will calculate the surface area and volumes of three-dimensional figures, including prisms, pyramids, cylinders, cones and spheres.
- Students will compare and contrast surface area and volume, and explain how they measure different aspects of a 3D shape.
- Students will use inductive reasoning to determine the formulas for volume of pyramids, cones and spheres using water or rice. **TI3(9-12)**
- Students will solve real-world problems involving surface area and volume. **CCE2(9-12)**
- Students will apply formulas in multi-step and word problems that involve composite solids.
- Students will sketch and interpret nets of three-dimensional figures to visualize surface area.
- Students will determine the effect of changing dimensions (scaling) on surface area and volume. **AA1(9-12)**
- Students will apply dimensional analysis and use correct units (square units for area, cubic units for volume).
- Students will justify their work and communicate reasoning through labeled diagrams and written explanations.
- Students will use spatial reasoning to identify cross-sections and build understanding of 3D geometry.
- Students will model solids using physical or digital tools and connect volume/surface area to real-world applications.
- Students will calculate the probability of a randomly chosen point landing in a target region of a 2D and 3D figure.
- Students will collaborate with a peer to solve real-world problems involving geometric probability in two dimensions

Teacher Resources: *White boards, Desmos, IXL, Khan Academy, rulers, compass, protractor, TI Graphing Calculator, Interactive Notebooks,*

various Geometry textbooks

AP PSYCHOLOGY CURRICULUM

	
Grade Level(s): 10-12	**Curriculum Author(s):** Marisa Christoff
Course Description: The AP Psychology course introduces students to the systematic and scientific study of human behavior and mental processes.While considering the studies that have shaped the field, students explore and apply psychological theories, key concepts, and phenomena associated with major units of study, including: biological bases of behavior, cognition, development, learning, social psychology, personality, and mental and physical health.Throughout the course, students apply psychological concepts and employ psychological research methods and data interpretation to evaluate claims, consider evidence, and effectively communicate ideas.	

Year At A Glance			
Unit Title	**Overarching Essential Question**	**Overarching Enduring Understanding**	**Vision of A Learner "I Can" Statements**
Introduction to Research Methods and Data Interpretation	How does the methodology of the research affect the outcome of a study?	The methodology of a psychological study—such as whether it uses experiments, correlational studies, case studies, surveys, or naturalistic observation—directly influences the type of data collected, the validity and reliability of the results, and the strength of the conclusions that can be drawn.	TCC2 (9-12), TCC4(9-12), AA1(9-12), CCE1(9-12), TI1(9-12)
Biological Bases of Behavior	Why do we learn biology in a psychology course?	Psychology is the scientific study of behavior and mental processes and all psychological phenomena studied throughout AP Psychology have a biological basis.	CCE1(9-12), CCE4(9-12),TCC2(9-12)
Cognition	How do cognitive factors affect decision making?	Human decision-making is influenced by a variety of cognitive biases, emotions, past experiences, the memory process, and social pressures.	CCE1(9-12), CCE3(9-12), AA1(9-12)
Development and Learning	What psychological factors influence how our sense of self develops and changes over time? What psychological principles explain how we can break bad habits and form healthier ones?	While your core identity may feel continuous, psychological research shows that people undergo significant changes in cognition, personality, and behavior as they grow and encounter new experiences, challenges, and relationships. Factors such as career, education, social environment, and even neurological changes all play a role in shaping your future self. Psychological research on learning	TCC2(9-12), DE1(9-12), TI1(9-12), TCC4(9-12)

		and behavior shows that habits are formed through repetition and reinforcement.Techniques such as classical and operant conditioning, behavior modification, and cognitive-behavioral strategies can help create lasting change.	
Social Psychology and Personality	How do social norms, group dynamics, and the behavior of others influence how we think, feel, and act? How do psychological theories explain the development and differences in personality?	Social psychology examines how the presence, behavior, and expectations of others influence individual thoughts, feelings, and actions. It explores how social norms, peer pressure, and group dynamics can lead to changes in behavior through phenomena such as conformity, deindividuation, obedience, and social facilitation. Psychological theories explain personality development and individual differences by examining the roles of traits, unconscious processes, personal experiences, environment, and cognition.	TCC1(9-12), TCC3(9-12), TCC4(9-12), CCE4(9-12)
Mental and Physical Health	How can we apply health, positive, and clinical psychology principles to change our lives, organizations, and communities in positive ways?	Health, positive, and clinical psychology work together to promote well-being by encouraging healthy behaviors, treating mental illness, building resilience, and supporting emotional and social growth in individuals and communities..	CCE3(9-12), TI2(9-12)
Post AP Exam Combating Stigmas Surrounding Mental Illness	What are the stigmas surrounding mental illness and how can we combat those stigmas?	Stigma around mental illness involves stereotypes, discrimination, and social judgment, often fueled by misconceptions and media portrayals.	DE2(9-12), CCE2(9-12), CCE4(9-12)

		This can lead to shame, isolation, and avoidance of help. To combat stigma, it's essential to increase mental health literacy, encourage open conversations, and promote compassion and understanding.	

Unit 0 - Introduction to Research Methods and Data Interpretation

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Understandings:

- The methodology of a psychological study—such as whether it uses experiments, correlational studies, case studies, surveys, or naturalistic observation—directly influences the type of data collected, the validity and reliability of the results, and the strength of the conclusions that can be drawn.
- Ethical guidelines protect the rights, dignity, and well-being of research participants and ensure the integrity of the research process.

Essential Questions:

- How does the methodology of the research affect the outcome of a study?
- How do ethical guidelines impact psychological research?

Students will know...

- Major historical figures in psychology
- Theoretical approaches to describing behavior

Students will be able to…

- Recognize how philosophical and physiological perspectives shaped the development of psychological thought.

• Branches of psychology • A variety of research methods used by psychologists • The application of research design and statistical analysis in psychology • Ethical guidelines	• Identify the research contributions of major historical figures in psychology. • Describe and compare different theoretical approaches in explaining behavior. • Recognize the strengths and limitations of applying theories to explain behavior. • Differentiate types of research with regard to purpose, strengths, and weaknesses. • Discuss the value of reliance on operational definitions and measurement in behavioral research. • Identify independent, dependent, confounding, and control variables in experimental designs. • Describe how research design drives the reasonable conclusions that can be drawn. • Distinguish between random assignment of participants to conditions in experiments and random selection of participants, primarily in correlational studies and surveys. • Predict the validity of behavioral explanations based on the quality of research design. • Apply basic descriptive statistical concepts, including interpreting and constructing graphs and calculating simple descriptive statistics. • Distinguish the purposes of descriptive statistics and inferential statistics. • Identify how ethical issues inform and constrain research practices. • Describe how ethical and legal guidelines protect research participants and promote sound ethical practice.
Key Vocabulary: psychology, scientific method, case study, naturalistic observation, random assignment, experimental method, experimental group, control group, independent variable, dependent variable, experimenter bias, confounding variables, double-blind, placebo, validity, correlational studies, correlation coefficient, measures of central tendency, mean, median, mode, range, standard deviation	
Assessment Evidence	
Performance Tasks: • Socratic Seminar (Research Journal : More Experience=Bigger Brain)	**Other Evidence:** • Unit Vocabulary Quiz

• Teacher Created Multiple Choice Assessment	

Learning Plan

Introduction and tour of College Board's AP Classroom
Develop success criteria for socratic seminar **TI1(9-12**
More Experience=Bigger Brain Socratic Seminar (inner circle/outer circle class rotation) **CCE1(9-12)**
Content based vocabulary assessment
Perspectives Activity **AA1(9-12)**
Compare and Contrast Research Methods
How to Answer the EBQ FRQ **TCC2(9-12)**
How to Answer the AAQ FRQ **TCC4(9-12)**

Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom

Unit 1 - Biological Bases of Behavior

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **CCE1(9-12):** I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.
- **CCE4(9-12):** I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.
- **TCC2(9-12):** I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions.

Understandings:

- Psychology is the scientific study of behavior and mental processes and all psychological phenomena studied throughout AP Psychology have a biological basis.
- Functions of our biological systems influence our physical and mental actions and responses.

Essential Questions:

- Why do we learn biology in a psychology course?
- How does knowledge of the connection between biological systems and mental processes help us live healthier lives?
- How much of who you are is determined by what's in your brain?

• Knowledge of biological functions and mechanisms — especially how neurons communicate, how the brain functions, and how sleep and sensation impact behavior and mental processes — help us gain a more comprehensive understanding of psychology as well as awareness of how all behaviors and mental processes are based in biological operations.	
Students will know... • the relationship between heredity and environment in shaping behavior and mental processes. • how to differentiate among the subsystems of the human nervous system and their functions. • how the structures and functions of typical neurons in the central nervous system affect behavior and mental processes. • how the basic process of neural transmission is related to behavior and mental processes. • how psychoactive drugs affect behavior and mental processes. • how the structures and functions of the brain apply to behavior and mental processes. • how the sleep/wake cycle affects behavior and mental processes throughout the day and night. • how the structures and functions that maintain balance (vestibular) and body movement (kinesthetic) relate to behavior and mental processes. • how the process of sensation is related to behavior and mental processes. • how the structures and functions of the visual sensory system relate to behavior and mental processes. • how the structures and functions of the auditory sensory system relate to behavior and mental processes. • how the structures and functions of the chemical sensory systems relate to behavior and mental processes. • how the structures and functions of the touch sensory system relate to behavior and mental processes. • how the structures and functions of the pain sensory system relate to behavior and mental processes.	**Students will be able to…** • Apply psychological perspectives, theories, concepts, and research findings to a scenario. • Determine the type of research design(s) used in a given study. • Identify psychology-related concepts in descriptions or representations of data. • Evaluate the appropriate use of research design elements in non-experimental methodologies. • Evaluate whether a psychological research scenario followed appropriate ethical procedures. • Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes. • Make a defensible claim.

Key Vocabulary: brain, CAT, MRI, EEG, delta waves, central nervous system, peripheral nervous system, autonomic nervous system, sympathetic nervous system, parasympathetic nervous system, neuron, dendrites, axon, agonists, antagonists, absolute threshold, difference threshold, neurotransmitters, serotonin, dopamine, norepinephrine, gaba inhibitory, endorphins, frontal lobes, parietal lobes, occipital lobes, temporal lobes, hypothalamus, medulla, pons, cerebellum, amygdala, limbic system,endocrine system, pituitary gland, thyroid, adrenal glands, ovaries, testes, insulin, ghrelin, leptin, cortisol, adrenaline, Broca,Wernike, split brain, corpus callosum, endocrine system, hormones, depressants, stimulants, hallucinogens, consciousness, sleep, dreaming, NREM, REM, sensation, perception, depth perception, visual cliff experiment,, top down processing, bottom up processing, phi phenomenon, signal detection theory, sensory adaptation, Weber's Law, perceptual set, hue, Trichromatic theory, opponent process theory, retina, rods, cones, synesthesia, cochlea, cocktail party effect, gate control theory

Assessment Evidence

Performance Tasks:

- Superhero Brain Project
- Neurotransmitter Podcast
- Unit 1 Progress Check (AP Classroom)

Each Progress Check contains 2 sections:
Section 1: Formative Multiple-Choice Questions
Section 2: 1 Free-Response Question, which can be either an Article Analysis Question or an Evidence-Based Question.

Other Evidence:
Unit Vocabulary Quiz
Socratic Seminar (Research Journal : One Brain Or Two)
End of Unit Concept Map

Learning Plan

- Research study analysis
- One Brain Or Two Socratic Seminar (inner circle/outer circle class rotation) **CCE1(9-12)**
- Content based vocabulary assessment
- Neuron Dance
- Neurotransmitter skits
- Superhero Brain Project
- Content based vocabulary cognitive map activity **CCE4(9-12)**
- Practice FRQ **TCC2(9-12):**

Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom

Unit 2 - Cognition

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **CCE1(9-12):** I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.
- **CCE3(9-12):** I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
- **AA1(9-12):** I can evaluate different approaches and justify the best pathway to success.

Understandings:

- Our senses are powerful tools for experiencing the world, but they are not always accurate or reliable.
- Human decision-making is influenced by a variety of cognitive biases, emotions, past experiences, the memory process and social pressures.
- Effective memory strategies often involve actively organizing

Essential Questions:

- Can you always trust your senses?
- How do cognitive factors affect decision making?
- What strategies do you use to help you remember important things?
- Why aren't our memories recorded by the brain exactly how we experienced them?

and encoding information in meaningful ways. Techniques like chunking, rehearsal, visualization, making connections to prior knowledge, and using mnemonic devices can help strengthen memory. ● Memory is a reconstructive process, not a perfect recording. When we remember something, we piece it together from bits of stored information, influenced by our current beliefs, emotions, and context. Over time, memories can change or become distorted due to interference, suggestion, or the blending of new information with old.	
Students will know... ● how internal and external factors influence perception. ● how visual perceptual processes produce correct or incorrect interpretations of stimuli. ● how psychological concepts and theories account for thinking, problem-solving,judgment, and decision-making. ● the types, structures, and processes of memory work. ● how different encoding processes work to get information into memory. ● how memory storage processes retain information in memory. ● how memory retrieval processes get information out of memory. ● possible reasons why memory failure or errors may occur. ● modern and historical theories describe intelligence. ● how intelligence is measured. ● how systemic issues relate to the quantitative and qualitative uses of intelligence assessments. ● how academic achievement is measured and experienced as compared to intelligence.	**Students will be able to…** ● Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes. ● Identify psychology-related concepts in descriptions or representations of data. ● Determine the type of research design(s) used in a given study. ● Apply psychological perspectives, theories, concepts, and research findings to a scenario. ● Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set. ● Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram. ● Propose a defensible claim.
Key Vocabulary: selective attention, intentional blindness, change blindness, gestalt, figure ground, retinal disparity, convergence, monocular cues, binocular cues, assimilation, accommodation, convergent thinking, divergent thinking, algorithm, heuristics, overconfidence, belief perseverance, encoding, storage, retrieval, effortful processing, automatic pocessing, metacognition, working memory, short term memory, long term memory, explicit memory, implicit memory, echoic memory, iconic memory, semantic memory, episodic memory, chunking, mnemonics,spacing effect, mood congruent memory, proactive interference, retroactive interference, misinformation effect, source amnesia,general intelligence, fluid intelligence, crystallized intelligence, savant syndrome, mental age, Stanfrod-Binet, intelligence quotient, standardization, normal curve, longitudinal study, cross sectional study, growth mindset	

<table>
<tr><th colspan="2">Assessment Evidence</th></tr>
<tr><td>Performance Tasks:
● Thinking, Problem Solving, and Language Infographic Project
● Unit 2 Progress Check (AP Classroom)
Each Progress Check contains 2 sections:
Section 1: Formative Multiple-Choice Questions
Section 2: 1 Free-Response Question, which can be either an Article Analysis Question or an Evidence-Based Question</td><td>Other Evidence:
● Unit Vocabulary Quiz
● Sensation versus Perception Debate
● Socratic Seminar (Research Journal : Thanks For The Memories)</td></tr>
<tr><th colspan="2">Learning Plan</th></tr>
<tr><td colspan="2">● Perception Hexagonal Thinking AA1(9-12
● Clive Wearing Case Study
● Thanks For The Memories Socratic Seminar (inner circle/outer circle class rotation) CCE1(9-12)
● Content based vocabulary assessment
● Introduction to Canva
● Thinking, Problem Solving, and Language Infographic CCE3(9-12)
● Practice FRQ</td></tr>
<tr><td colspan="2">Teacher Resources:College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board’s AP Classroom</td></tr>
</table>

Unit 3 - Development and Learning

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **DE1(9-12):** I can acknowledge, process, and respond appropriately to others' comments and perspectives.
- **TCC2(9-12):** I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions.
- **TI1(9-12):** I can implement a realistic plan and adapt when necessary to achieve my goals.
- **TCC4(9-12):** I can integrate my learning to adapt to experiences in the classroom, career and life.

Understandings:

- While your core identity may feel continuous, psychological research shows that people undergo significant changes in cognition, personality, and behavior as they grow and encounter new experiences, challenges, and relationships. Factors such as career, education, social environment, and even neurological changes all play a role in shaping your future self.

Essential Questions:

- What psychological factors influence how our sense of self develops and changes over time?
- What psychological principles explain how we can break bad habits and form healthier ones?

• Psychological research on learning and behavior shows that habits are formed through repetition and reinforcement.Techniques such as classical and operant conditioning, behavior modification, and cognitive-behavioral strategies can help create lasting change.	
Students will know... • how physical development before birth applies to behavior and mental processes. • how physical development in infancy and childhood apply to behavior and mental processes. • how physical development in adolescence applies to behavior and mental processes. • how physical development in adulthood applies to behavior and mental processes. • how theories of cognitive development apply to behavior and mental processes. • how key components of language and communication apply to behavior and mental processes. • how language develops in humans. • how social development relates to behavior and mental processes. • how classical conditioning applies to behavior and mental processes. • how operant conditioning applies to behavior and mental processes. • how social learning applies to behavior and mental processes. • how cognitive factors in learning apply to behavior and mental processes.	**Students will be able to…** • Apply psychological perspectives, theories, concepts, and research findings to a scenario. • Determine the type of research design(s) used in a given study. • Propose a defensible claim. • Evaluate the appropriate use of research design elements in non-experimental methodologies. • Evaluate whether a psychological research scenario followed appropriate ethical procedures. • Evaluate the appropriate use of research design elements in experimental methodology. • Propose a defensible claim.
Key Vocabulary: germinal stage, embryonic stage, fetal stage, teratogens, maturation, schema, assimilation, accomodation, attachment, critical period, imprinting, temperment, adolescence, puberty, menopause, social learning theory, sensorimotor stage, object permanence, preoperational, egocentrism, concrete operational, formal operational, phoneme, morpheme, telegraphic speech, linguistic determinism, stranger anxiety, strange situation, attachment, social clock, habituation, classical conditioning, operant conditioning, acquisition, extinction, spontaneous recovery, discrimination, generalization,US, CS, UR, CR, neutral stimulus, taste aversion, flooding, systematic desensitization, Law of Effect, Skinner, Skinner Box, successive approximations, shaping, reinforcer, positive reinforcement, negative reinforcement, positive punishment, negative punishment, fixed ratio, fixed interval, variable ratio, variable interval, token economy, observational learning, modeling	

Assessment Evidence	
Performance Tasks: ● Design a Conditional Experiment ● Unit 3 Progress Check (AP Classroom) Each Progress Check contains 2 sections: Section 1: Formative Multiple-Choice Questions Section 2: 1 Free-Response Question, which can be either an Article Analysis Question or an Evidence-Based Question	**Other Evidence:** Unit Vocabulary Quiz Socratic Seminar (Research Journal : How Moral Are You) Socratic Seminar (Research Journal : Maps In Your Mind)
Learning Plan	
● Piaget Meets Santa ● Psychosocial Scenarios **TCC4(9-12)** ● Research analysis study ● How Moral Are You Socratic Seminar (inner circle/outer circle class rotation) **DE1(9-12)** ● Content based vocabulary assessment ● Peer reflection on conditional experiments **TI1(9-12)** ● Maps In Your Mind Socratic Seminar (inner circle/outer circle class rotation) **DE1(9-12)** ● Practice FRQ **TCC2(9-12)**	
Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom	

Unit 4 - Social Psychology and Personality

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **TCC1(9-12):** I can ask purposeful, insightful questions to find a variety of innovative solutions.
- **TCC3(9-12):** I can integrate relevant information to produce multiple valid solutions.
- **TCC4(9-12):** I can integrate my learning to adapt to experiences in the classroom, career and life.
- **CCE4(9-12):** I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.

Understandings:

- Social psychology examines how the presence, behavior, and expectations of others influence individual thoughts, feelings, and actions. It explores how social norms, peer pressure, and group dynamics can lead to changes in behavior through phenomena such as conformity, deindividuation, obedience, and social facilitation.

Essential Questions:

- How do social norms, group dynamics, and the behavior of others influence how we think, feel, and act?
- How do expectations, biases, and attitudes affect our relationships with ourselves and others?
- How do intrinsic and extrinsic motivations interact to influence human behavior?

• Our expectations, cognitive biases, and attitudes shape how we interpret the world, often without us realizing it. • Human behavior is driven by a combination of intrinsic (internal) and extrinsic (external) motivations. • Psychological theories explain personality development and individual differences by examining the roles of traits, unconscious processes, personal experiences, environment, and cognition.	• How do psychological theories explain the development and differences in personality?
Students will know… • how attribution theory applies to behavior and mental processes. • how locus of control (internal and external) applies to behavior and mental processes. • how person perception applies to behavior and mental processes. • how stereotypes and implicit attitudes contribute to the behaviors and mental processes of prejudice and discrimination. • how belief, perseverance and cognitive dissonance apply to attitude formation and change. • how the social situation affects behavior and mental processes. • how being in a group can affect an individual's behavior and mental processes. • how prosocial behavior affects behavior and mental processes. • how the psychodynamic theory of personality defines and assesses personality. • how the humanistic theory of personality defines and assesses personality. • how the social cognitive theory of personality defines and assesses personality. • how trait theories of personality define and assess personality. • how theories about motivation apply to behavior and mental processes. • how eating and belongingness motivate behavior and mental processes. • how theories of emotion apply to behavior and mental processes. • how social norms and experiences influence the expression of	**Students will be able to…** • Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes. • Evaluate the appropriate use of research design elements in experimental methodology. • Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm. • Evaluate whether a psychological research scenario followed appropriate ethical procedures. • Apply psychological perspectives, theories, concepts, and research findings to a scenario. • Determine the type of research design(s) used in a given study.

emotions.	

Key Vocabulary: fundamental attribution error, foot in the door phenomenon, in group, out group, scapegoat theory, self-serving bias, false consensus effect, confirmation bias, just-world hypothesis, Central route to Persuasion, Peripheral route to persuasion, cognitive dissonance, conformity, normative social influence, obedience, social loafing, social facilitation, deindividuation, group polarization, groupthink, bystander effect, mere-exposure effect, self-fulfilling prophecy, psychoanalysis, Id, ego superego, defense mechanisms, displacement, repression, collective unconscious, inferiority complex, archetypes, learned helplessness, collective culture, individualistic culture, Five Factor Model of Personality, Thematic Apperception Test, Rorschach Inkblot Test, hierarchy of needs, self-actualization, unconditional positive regard, trait, Minnesota Multiphasic Personality Inventory, reciprocal determinism, self serving bias, individualism, collectivism, instinct, drive reduction theory, incentive, Yerkes-Dodson Law, intrinsic motivation, extrinsic motivation, emotion

Assessment Evidence

Performance Tasks: ● Socratic Seminar (Research Journal : To Help Or Not Help) ● Unit 4 Progress Check (AP Classroom) Each Progress Check contains 2 sections: Section 1: Formative Multiple-Choice Questions Section 2: 1 Free-Response Question, which can be either an Article Analysis Question or an Evidence-Based Question	**Other Evidence:** ● Unit Vocabulary Quiz ● Neo-Freudian Historical Head

Learning Plan

- Freud Decision Making Activity **CC3(9-12)**
- Defense Mechanism Scenarios **TCC4(9-12):**
- Self Actualization Case Studies **CCE4(9-12):**
- Content based vocabulary assessment
- Research study analysis
- To Help Or Not Help Socratic Seminar (inner circle/outer circle class rotation) **TCC1(9-12)**
- Hunger Motivation Stations **TCC3(9-12):**
- Practice FRQ

Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom

Unit 5 - Mental Health and Physical Health

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.6**: Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.
- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.RI.8.3** Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- **CCSS.ELA-LITERACY.L.11-12.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- **CCSS.ELA-LITERACY.SL.11-12.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.SL.11-12.1a** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **CCE3(9-12):** I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
- **TI2(9-12):** I can evaluate my objectives and a variety of credible resources to find the best solutions for any challenge.

Understanding:

- Psychologists define typical behavior using statistical, functional, and cultural standards, while considering the 4 D's—distress, dysfunction, deviance, and danger. What is considered "typical" can vary across cultures, contexts, and time periods.
- Health, positive, and clinical psychology work together to promote well-being by encouraging healthy behaviors, treating mental illness, building resilience, and supporting emotional and

Essential Questions:

- How do psychologists define typical behaving, thinking, and acting?
- How can we apply health, positive, and clinical psychology principles to change our lives, organizations, and communities in positive ways?
- Where can someone find help if they think they or someone they care about is experiencing a psychological illness?

social growth in individuals and communities. ● Help for psychological illness is available through a range of mental health professionals, including clinical psychologists, psychiatrists, counselors, and social workers.	
Students will know… ● how health psychology addresses issues of physical health and wellness as they apply to behavior and mental processes. ● how stress applies to behavior and mental processes. ● how reactions to stress apply to behavior and mental processes. ● how the ways that people cope with stress applies to behavior and mental processes. ● how positive psychology approaches the study of behavior and mental processes. ● how positive subjective experiences apply to behavior and mental processes. ● the approaches used to define behaviors and mental processes as psychological disorders. ● how psychological perspectives define psychological disorders. ● how interaction models define psychological disorders. ● the symptoms and possible causes of selected neurodevelopmental disorders. ● the symptoms and possible causes of selected schizophrenic spectrum disorders. ● the symptoms and possible causes of selected depressive disorders. ● the symptoms and possible causes of selected bipolar disorders. ● the symptoms and possible causes of selected anxiety disorders. ● the symptoms and possible causes of selected obsessive-compulsive disorders and related disorders. ● the symptoms and possible causes of selected dissociative disorders. ● the symptoms and possible causes of selected trauma and stressor-related disorders. ● the symptoms and possible causes of selected feeding and eating disorders.	**Students will be able to…** ● Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes. ● Propose a defensible claim. ● Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm. ● Apply psychological perspectives, theories, concepts, and research findings to a scenario.

• the symptoms and possible causes of selected personality disorders. • research and trends in the treatment of psychological disorders. • ethical principles in the treatment of psychological disorders. • techniques used with psychological therapies. • how group therapy is different from individual therapy. • effective uses of hypnosis. • interventions derived from the biological perspective.	
Key Vocabulary: health psychology, stress, coronary heart disease, problem focused coping, emotion focused coping, personal control, learned helplessness, broaden and build theory,medical model epigenetics, DSM-V, OCD, GAD, Panic Disorder, Agoraphobia, PTSD, Hypochondriasis, DID, Depression, Bipolar, Schizophrenia, delusion, Narcissistic, Histrionic, Borderline, Antisocial, Autism Spectrum Disorder, ADHD, free association, interpretation, resistance, Rational-emotive behavior therapy, insight therapies,exposure therapies, person centered therapy, cognitive-behavior therapy, antipsychotic drugs, antianxiety drugs, antidepressant drugs, SSRIs, ECT, hypnosis, dissociation	
Assessment Evidence	
Performance Tasks: • Abnormal Psychology Case Study Diagnosis Project • Unit 5 Progress Check (AP Classroom) Each Progress Check contains 2 sections: Section 1: Formative Multiple-Choice Questions Section 2: 1 Free-Response Question, which can be either an Article Analysis Question or an Evidence-Based Question	**Other Evidence:** • Unit Vocabulary Quiz • Treatment Scenarios
Learning Plan	
• Content based vocabulary assessment • Introduction to the DSM and how psychologists diagnose disorders • Psychological Disorder Case Studies **CCE3(9-12)** • Practice FRQ **TI2(9-12):**	
Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom	

Unit 6 - Post AP Exam-Combating Stigmas Surrounding Mental Illness

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:
Common Core State Standards

- **CCSS.ELA-LITERACY.RH.9-10.7**: Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- **CCSS.ELA-LITERACY.SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

- **DE2(9-12):** I can honor my own feelings and show empathy toward others through my actions.
- **CCE2(9-12):** I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.
- **CCE4(9-12)**: I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.

Understandings:

- Stigma around mental illness involves stereotypes, discrimination, and social judgment, often fueled by misconceptions and media portrayals. This can lead to shame, isolation, and avoidance of help. To combat stigma, it's essential to increase mental health literacy, encourage open conversations, and promote compassion and understanding.

The Institute of Living/Hartford Hospital sponsors an academic and art competition designed to decrease the stigma of mental illness. The BrainDance Awards encourage students to gain knowledge about psychiatric diseases and develop a more tolerant and realistic perspective toward people with severe psychiatric problems. The competition also aims to promote students' interest in careers in mental health care.

Essential Questions:
What are the stigmas surrounding mental illness and how can we combat those stigmas?

Students will know…

- how to explain behavior in authentic contexts.
- how to apply theories and perspectives in authentic contexts.

Students will be able to…

- create an artistic or academic project of your choice for the Brain Dance Awards.
- spread awareness against the stigma surrounding mental illness

	and foster empathy for those who suffer from a mental illness.
Key Vocabulary: Mental illness, DSM-V, stigma	
Assessment Evidence	
Performance Tasks: Hartford Hospital Brain Dance Award Project	**Other Evidence:** ● Project Proposal ● Peer Feedback Activity
Learning Plan	
● Preview and score previous winners of the Brain Dance Award Competition **CCE2(9-12)** ● Hartford Hospital Brain Dance Award Project **DE2(9-12), CCE4(9-12)**	
Teacher Resources: College Board Approved AP Textbook; College Board AP Classroom; 40 Studies That Changed Psychology by Robert Hock, College Board's AP Classroom, Hartford Hospital Brain Dance Website, Past Brain Dance Award Entries	

Regional School District 14 New Course Proposal

Course Title: Computer Aided Drafting 1/ CTState CAD 1330

Grade Level(s): 9-12

Department: Fine Arts/Technology Education

Faculty Member(s) Submitting Course Proposal: Katie Blake and Taryn Fernandez

Course Description: *(Please include a brief description of the course, the graduation requirements the course would help students meet (STEM/Humanities), and whether it is a year long or semester long course.)*
In partnership with Ed Advance's College and Career Accelerator program and CTState, Nonnewaug will be offering 2D CD (AutoCAD). In alignment with CTState's course description, the objective of this course is to give the student a basic understanding of Computer Aided Drafting using the latest version of AutoCAD. The student will learn drafting fundamentals for engineering through projects from various technical disciplines. Topics include drawing setup, text, dimensioning, layering systems, blocks, printing and plotting, orthographic and isometric, and section views as well. Upon finishing this course, students should be able to prepare drawings in their own engineering disciplines.

Rationale for Offering this New Course: *(Please include the anticipated impact on students, how it complements existing course offerings, and the identified educational need this course would address.)*

With the introduction of Advanced Manufacturing at Woodbury Middle School through Goodwin University, we want to be sure to provide a path forward for those students who are interested in pursuing a career in advanced manufacturing.

Prerequisites: *(Please list any prerequisite knowledge, skills, or coursework that must be completed in order for students to be prepared for the course.)*

There are no prerequisites for this course.

Long-Term Course Outcomes: *(Please list the projected long-term student outcomes as a result of students being enrolled in the course.)*

As the course progression develops and students complete the certification program, there may be opportunities to further expand the program to a Mechanical Computer Aided Design Certification, then a Mechatronics Automation Technician Certificate, and possibly a Technology Engineering Education Associate Degree. CT is home to numerous advanced manufacturing plants and there is a critical demand for skilled workers. According to the 2025 Connecticut Manufacturing Report, 82% of manufacturers report difficulty finding and retaining workers with most applicants lacking training and skills. This would be the initial course in a sequence of courses that would prepare our students for a career right out of high school and/or position them for a shortened college experience as they enter having already earned credits towards their specialty.

Scope and Sequence: *(Please provide a bulleted overview of the course content to include anticipated*

units, skills students will develop, Vision of A Learner attributes that will be practiced/demonstrated, and any resources that have already been identified for use)

- Introduction & Navigating the AutoCAD Interface
    - Understanding the use case for CAD vs. hand-drawing.
    - Introduction to the basic layout of the AutoCAD software environment.
    - Basic navigation of AutoCAD: file creation & storage, creating a basic drawing.
    - Cartesian X/Y/Z coordinate grid, and how AutoCAD understands space.
    - Introduction to strategic thinking in CAD.
- Basic Sketching Elements
    - How to use all the basic sketch tools to create foundational shapes: lines, splines, rectangles, circles, arcs, ellipses, polygons.
    - Specifying the length and/or angular direction/orientation of lines, and the radius/diameters of circle/arc elements.
    - Customizing settings within the software to more efficiently and easily use the tools to create shapes and create the visual representations you prefer.
    - Using trim/delete to remove portions of elements, specifically as a method of creating more complex shapes in an iterative sequence of drawing/trimming.
- Dimensioning Sketch Elements, Layers, and Fully Defining Elements
    - Dimensioning conventions used in engineering and manufacturing, as well as how to create these in AutoCAD. How to use DIMSTYLE.
    - Using layers to separate different types of drawing elements (object lines, construction lines, dimensions, projection lines, etc.).
    - Fully defining elements of their design to specify all aspects of their shape.
    - Introduction to parametric design, thinking strategically, adjusting drawings/dimensions.
- Modify Tools--Fillets, Chamfers, Mirrors, Offsets--and Design Intent
    - Using more advanced sketching tools beyond simple shapes/sketch elements. These modified tools are secondary/meta tools that build on the sketch tools, and include tools like chamfers, fillets, mirrors, offsets, polar and linear arrays, scale, move, copy, etc.
    - Planning the sequence of creation for more complex shapes--what's the most efficient way to build up a complex shape, piece by piece.
- Documentation & Display (Title Blocks), and Multiview Orthographics
    - Industry standards for dimensioning and documentation.
    - Using title blocks in AutoCAD to systematize information sharing for a shape.
    - Creating multiview orthographic drawings in AutoCAD--ensuring correct layout with projection lines, and making sure to include all views (front/top/side) so that the object is fully described.
- Auxiliary and Section Views
    - Auxiliary views: when are they necessary and how to create them?
    - Section views: when are they necessary, what are the different kinds of section views, and how to create them?
    - Shading/hatching in AutoCAD
- Isometric Drafting
    - Isometric views: How to create them in AutoCAD using standard orthographic tools, as well as tools like Isocircle.
- Parametric Design
    - Geometric constraints: Benefits, as well as frustrations, of using them.
    - Dimensional constraints: How to set them up, both as set quantities, as well as relative quantities based on formulas/relationships between elements.
    - Testing the efficacy and functioning of constraints, including troubleshooting errors.
    - Parameter manager.

The Vision of a Learner attributes that will be practiced and demonstrated throughout this course include the following:

- TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.

- CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.
- TI1(9-12): I can implement a realistic plan and adapt when necessary to achieve my goals.
- TI3(9-12): I can formulate and investigate probing questions to further my learning.
- P3(9-12): I can accept constructive feedback and use setbacks to adjust my learning journey in order to reach my goals.
- P4(9-12): I can take-on challenges and continuously engage in my own long-term strategies to overcome them to demonstrate through personal experience that failures are more instructive than discouraging.AA1(9-12): I can evaluate different approaches and justify the best pathway to success.
- AA2(9-12): I can assess my past successes and mistakes to change my approach.

Required Resources and Projected Financial Needs: *(Please list any resources that would be required to teach the course and their projected cost.)*

Blueprints Textbook ($113 per textbook) - anticipate a cost of approximately $3600 - This is the same textbook that will be used throughout the 3-course CAD sequence.

Regional School District 14 New Course Proposal

Course Title: Computer Aided Drafting 2 (Parametric Design)/ CTState CAD 2200

Grade Level(s): 9-12

Department: Fine Arts/Technology Education

Faculty Member(s) Submitting Course Proposal: Katie Blake and Taryn Fernandez

Course Description: *(Please include a brief description of the course, the graduation requirements the course would help students meet (STEM/Humanities), and whether it is a year long or semester long course.)*
In partnership with Ed Advance's College and Career Accelerator program and CTState, Nonnewaug will be offering Parametric Design (3D AutoCAD). In alignment with CTState's course description, this is an introduction to computer-based design using SolidWorks® parametric 3D CAD software. The course focuses on Parametric Modeling and topics include: Design Intent and Process, Sketching Techniques, Model Development Techniques, Process-Specific Modeling, Design Changes, Editing Models, Patterning and Assembly Techniques. Students will participate in mostly individual and some group design projects as appropriate.

Rationale for Offering this New Course: *(Please include the anticipated impact on students, how it complements existing course offerings, and the identified educational need this course would address.)*

With the introduction of Advanced Manufacturing at Woodbury Middle School through Goodwin University, we want to be sure to provide a path forward for those students who are interested in pursuing a career in advanced manufacturing. This is the second course in a three-course series.

Prerequisites: *(Please list any prerequisite knowledge, skills, or coursework that must be completed in order for students to be prepared for the course.)*

Computer Aided Drafting 1/CTState CAD 1330

Long-Term Course Outcomes: *(Please list the projected long-term student outcomes as a result of students being enrolled in the course.)*

As the course progression develops and students complete the certification program, there may be opportunities to further expand the program to a Mechanical Computer Aided Design Certification, then a Mechatronics Automation Technician Certificate, and possibly a Technology Engineering Education Associate Degree. CT is home to numerous advanced manufacturing plants and there is a critical demand for skilled workers. According to the 2025 Connecticut Manufacturing Report, 82% of manufacturers report difficulty finding and retaining workers with most applicants lacking training and skills. This would be the second course in a sequence of courses that would prepare our students for a career right out of high school and/or position them for a shortened college experience as they enter having already earned credits towards their specialty.

Scope and Sequence: *(Please provide a bulleted overview of the course content to include anticipated*

units, skills students will develop, Vision of A Learner attributes that will be practiced/demonstrated, and any resources that have already been identified for use)

- Introduction & Navigating the SolidWorks Interface
    - Deeper understanding of the use case for CAD vs. hand-drawing.
    - Introduction to the basic layout of the SolidWorks software environment.
    - Basic navigation of SolidWorks: file creation & storage, creating a basic part.
    - Cartesian X/Y/Z coordinate grid, and how SolidWorks understands space and part creation.
    - Introduction to strategic thinking in CAD in 3D.
- Basic Sketching & Modifying Tools
    - How to use all the basic sketch & modify tools to create foundational shapes: lines, splines, rectangles, circles, arcs, ellipses, polygons.
    - Using the Smart Dimension tool to specify the length and/or angular direction/orientation of lines, and the radius/diameters of circle/arc elements.
    - Customizing settings within the software to more efficiently and easily use the tools to create shapes and create the visual representations you prefer.
- Intro to creating 3D features from 2D sketches--Adding
    - How to think strategically about creating a 3D shape from 2D profiles: being intentional about selecting a plane to create a new sketch on, intentionally locating elements at the origin/along axes to facilitate mirroring, etc., and beginning to think more strategically about how to create a more complex 3D shape from a variety of sub-parts.
    - How to use the Extruded Boss/Base tool to "push out" a 2D profile into 3D, and how to manipulate the various parameters of the Extruded Boss/Base tool.
- Intermediate modeling techniques
    - How to think about design intent, and strategic choices in creating 3D shapes.
    - How to use feature tools like fillet, chamfer, mirror, move/copy, circular and linear patterns to create more complex shapes in a time-saving way.
    - How to use the Revolved Boss/Base tool to rotate a 2D profile around an axis to create a 3D geometry, and how to manipulate the various parameters of the Revolved Boss/Base tool.
- SolidWorks Drawings
    - Creating a SolidWorks drawing file (.slddrw) from a SolidWorks part (.sldprt) file
    - Inserting different types of views, with settings (annotations, scale, transparency, etc.).
    - Importing/adding dimensions to the drawing.
    - Adding Title Blocks to drawings.
- Assemblies
    - Purpose and use cases of SolidWorks Assemblies.
    - Creating assemblies from existing parts; inserting parts into assemblies; fixed vs. floating parts within an assembly.
    - Different types of mating relationships (colinear, concentric, etc.)
    - How to apply mating relationships between part entities (edges, faces, points, etc.) to achieve a desired model of how parts interact and move (or not move) with relation to each other.
- Manufacturing/3D printing/Engineering/Re-Engineering
    - The engineering process (Cycle: Define the problem; conduct research; brainstorm solutions; create a prototype; test & analyze; improve; restart process). Failure/setbacks are part of a process.
    - Tolerancing, and thinking through how parts are connected in the real world.
    - Additive manufacturing: 3D printing, using a 3D printer's software platform (importing, orienting the model, deciding parameters for things like supports/rafts, slicing, etc.).
    - Design/Manufacturing interplay: You can't always manufacture things as they're designed, so designers need to consider manufacturing constraints when creating designs.

The Vision of a Learner attributes that will be practiced and demonstrated throughout this course include the following:

- TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.

- CCE2(9-12): I can give and receive actionable and relevant feedback with openness to be able to determine meaningful revisions for success.
- TI1(9-12): I can implement a realistic plan and adapt when necessary to achieve my goals.
- TI3(9-12): I can formulate and investigate probing questions to further my learning.
- P3(9-12): I can accept constructive feedback and use setbacks to adjust my learning journey in order to reach my goals.
- P4(9-12): I can take-on challenges and continuously engage in my own long-term strategies to overcome them to demonstrate through personal experience that failures are more instructive than discouraging.AA1(9-12): I can evaluate different approaches and justify the best pathway to success.
- AA2(9-12): I can assess my past successes and mistakes to change my approach.

Required Resources and Projected Financial Needs: *(Please list any resources that would be required to teach the course and their projected cost.)*

Blueprints Textbook ($113 per textbook) - anticipate a cost of approximately $3600 - This is the same textbook that will be used throughout the 3-course CAD sequence.

Regional School District 14 New Course Proposal

Course Title: An American History of Rock and Soul

Grade Level(s): 10-12

Department: History/Social Studies

Faculty Member(s) Submitting Course Proposal: Dr. Taryn Fernandez

Course Description: *(Please include a brief description of the course, the graduation requirements the course would help students meet (STEM/Humanities), and whether it is a year long or semester long course.)*

This course was developed as the result of a partnership between the CT State Department of Education and TeachRock. This is a semester-based course that, as described by the CSDE and TeachRock "transforms learning for a new generation by connecting students through American music. [The course] traces the evolution of American popular music from post-war America to the new millennium. Students will explore the genesis and musical characteristics of a variety of genres–including Rock and Roll, Soul, R&B, Electronica, and Hip Hop–while also investigating how those genres are situated in American history. By the end of the course, students will have a deeper understanding of not only the historical development of American popular music, but also the interrelation between music and U.S. political, social, and cultural history. In working through this course, they will also strengthen analytical skills related to music appreciation and historical inquiry."

Rationale for Offering this New Course: *(Please include the anticipated impact on students, how it complements existing course offerings, and the identified educational need this course would address.)*

With the increase from 2.5 credits to 3 credits in social studies/history in the graduation requirements at Nonnewaug, this course will offer an additional elective option that seeks to connect students to history through music and performance, engaging students who may otherwise have not continued with the study of American History.

Prerequisites: *(Please list any prerequisite knowledge, skills, or coursework that must be completed in order for students to be prepared for the course.)*

Students must complete their World History requirement prior to enrolling and may take this course concurrently with US History.

Long-Term Course Outcomes: *(Please list the projected long-term student outcomes as a result of students being enrolled in the course.)*

Students will further connect to American History through the incorporation of musical history with a focus on music being how youth connected with each other, the world, and all that was happening around them. Students will develop their critical and creative thinking skills through the analysis of musical genres and their impact on society as well as their connections to current events and other periods in our nation's history.

Scope and Sequence: *(Please provide a bulleted overview of the course content to include anticipated units, skills students will develop, Vision of A Learner attributes that will be practiced/demonstrated, and any resources that have already been identified for use)*

The scope and sequence below is provided by the CSDE and TeachRock. It represents the outline for our course. The Nonnewaug teacher(s) who will be teaching the course will develop curriculum prior to its implementation, reviewing the resources and unit content in-depth and tailoring the course to the needs and prior knowledge of our students to align with our course of studies. Throughout the course, students will have numerous opportunities to develop, practice, and demonstrate all of the Vision of a Learner attributes: Collaborating and communicating effectively, thinking critically and creatively, adapting and adjusting, demonstrating empathy, persevering and taking initiative. They will also identify these attributes in the musical artists they study as evidence of the impact these attributes can have on societal change.

“The course is organized by decade, from events leading into the 1950s through the 1990s. Within each decade, there are multiple units aligned to musical or historical themes. Each lesson includes a variety of media that students will analyze as a primary historical source, including but not limited to song lyrics, album covers, performance videos, historical documents, and artist interviews. Each lesson also includes a creative arts-integrated activity or project that allows students to assert their own perspective and experience in the conversation.

1950s: In the mid-1950s, Rock and Roll slammed into the consciousness of the American people. It was the first American musical tradition constructed from the many musical traditions that animated life in the 20th century, including Gospel, Blues, Country, Jazz and R&B. In bringing together these musical bloodlines, Rock and Roll also brought people together, from across regions, across race and class lines, and, finally, across oceans. It was the beginning of a historical turn that would change daily life in the modern world.

1960s: From its raucous beginnings to the time of its mainstream acceptance, Rock and Roll was youth music. More exactly, it was the music of the teenager. Born of postwar affluence and the increased leisure time such affluence afforded young Americans, the idea of the teenager was new to the American landscape. If for some they were an object of anxiety, this had everything to do with the fact that teenagers defined themselves in opposition to the parent generation. Rebellion was a part of being a teenager. And Rock and Roll was an expression of that rebellion and of the growing gap between generations. From the teen surf culture celebrated in the music of the Beach Boys to the mini-melodramas of the Shangri-Las’ Girl Group, sound and teen dances including the Twist, the Stroll, the Mashed Potato, and the Watusi, the world of the teenager was made larger and more powerful through the music itself. As 60s Soul and the British Invasion demonstrated, it would be the teenagers, inspired by their music, who would define American life moving forward.

1970s: The teenage culture of the fifties and early sixties was the seedbed for the youth-driven counterculture of the late sixties and early seventies. This shift toward a countercultural sensibility among young people was reflected in the music itself. If in the fifties Rock and Roll had been viewed primarily as a popular entertainment, in the period of “transformation” it would come to be viewed as–in its most elevated forms–an art. In the hands of Bob Dylan, the Rolling Stones, the Beatles, and others, music became a “serious” thing. As young people faced the troubling facts of a war that included them and a country that refused them the right to vote, music now offered, among other things, a megaphone through which their disillusionment could be voiced. As the nation saw the rise of the Civil Rights movement and the Black Power movement that followed, artists like Marvin Gaye, James Brown, and Stevie Wonder used music to express feelings of frustration about the racial divide and excitement around the possibility of change. And as the music addressed the world of which it was a part, the music grew more complex, more varied—but, importantly, that music was also changing the world in ways it hadn’t previously.

1980s: For a brief time, Rock and Roll seemed almost to be building its own utopia. In late sixties Rock and Roll culture in particular, the walls erected in the wider world – between the races, between men and women, between nations – seemed to collapse. The record collections of the young Rock and Roll audience often included R&B, Hard Rock, Blues, Pop, Jazz, Country, and more. Free Form FM radio mirrored this eclectic but inclusive approach to music by creating inventive playlists unbound by genre. And, then, as the "Fragmentation" crept in, the old walls seemed to reassert themselves. Fan communities, radio formats, and, indeed, even personal record collections came to be defined by genre. Hard lines were drawn. Punks defined themselves in opposition to the fans of arena rock groups like Led Zeppelin. Grunge borrowed from Heavy Metal but, more adamantly still, refused the theater of Heavy Metal. Radio was again split down racial lines. If Rock and Roll culture, in the broad sense, had been connected with youth culture as a whole, and this brought different genres and traditions into dialogue with one another, now Rock and Roll culture grew increasingly fragmented. It wouldn't mean the end of the music, but the promise of late sixties Rock and Roll was, for the moment, compromised."

Required Resources and Projected Financial Needs: *(Please list any resources that would be required to teach the course and their projected cost.)*

Resources for this course are provided at NO COST to CT school districts by TeachRock. The resources are not mandated - they can and will be reviewed and selected to fit the needs of our district.

- "TeachRock lessons provide the content for An American History of Rock and Soul. Each lesson includes complete lesson plans, rich media assets, primary source documents, and handouts. To access these materials, you will be required to create a free account at teachrock.org."